INDIA RUBBER WORLD

Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO

No. 15 West 38th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 49. DECEMBER 1, 1913. No. 3

SUBSCRIPTIONS: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank or draft, Postoffice or Express money orders on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

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Entered at the New York postoffice as mail matter of the second class.

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THE RUBBER TRADE'S DEBT TO GUAYULE.

IT is safe to say that every reader of this publication will be interested in the account which appears in this issue of William Appleton Lawrence, the man whose efforts more than those of any other man gave guayule to the rubber industry. It was known for sixty years before Mr. Lawrence began his experiments that the guayule shrub of northern Mexico contained rubber, but no one had been able to discover how to get it out. Mr. Lawrence thought, as others had thought before him, that the extraction must be effected chemically; but he finally discovered that the process was much simpler—that it was merely one of rubbing and water. In 1905—four years after he began his experiments—he arrived at the proper solution, and guayule extraction began to assume commercial dimensions.

In 1906 the first considerable exports were made from Mexico, amounting to a little over 5,000,000 pounds. The volume of these exports increased rapidly until 1910, when they reached over 28,000,000 pounds. But in the following year those Mexican disturbances which have lately given the American dailies so much material for scare heads, and are supposed to be giving the Washington administration many sleepless nights, broke out, and since that time the exports of guayule—along with all other Mexican enterprises—have lanquished, for the present year amounting only to a little over 5,000,000 pounds, and practically having ceased early in May.

Since 1906 the world's rubber supply has been increased by over 128,000,000 pounds of guayule. To get some idea of this vast contribution, it is only necessary to compare it with the plantation output which, up to the end of 1912, had reached only 2,000,000 pounds more than this figure, while as compared with the product of the Amazon, it exceeds by 33,000,000 pounds the record figure made by Pará and Manáos combined in 1912 of 95,000,000 pounds. Old Dean Swift used to remark that that man was a true benefactor of the race who made two blades of grass grow where only one had grown before. What shall we say of the men who have contributed to the world's supply of rubber nearly 130,000,000 pounds where there was none before, and who have got all this from a despised and neglected weed?

RUBBER SCRAP TOO HIGH.

TIME was when scrap rubber—old shoes, for example—was sold to the reclaimers at two and three cents a pound. It is possible that, considering the present high cost of living and of labor, it could not be supplied by the scrap men at that price today. The market for scrap, however, depends upon the state of the crude rubber market. High-priced crude has always meant high-priced scrap. Low-priced rubber has always—that is, up to the present—meant a corresponding fall in the price of scrap. For a long time crude rubber has been steadily falling. Nor with the great increase of plantation rubber is there much likelihood of any appreciable advance. Yet old shoes are held at eight cents and better. At that price crude rubber, compounded, is better and cheaper, and that is what the manufacturers are using. The reclaimers admit that scrap is too high, that they cannot quote lower prices until it drops—and still it holds up. It is hard luck for the big collectors, who stand to lose, but it is folly to try to smash the law of supply and demand, and it is that law that they are up against.

As throwing an interesting light on the relative movements of Pará and scrap prices, and particularly as showing that while the price of Pará has greatly declined in the last four years, shoe scrap prices have remained practically the same, a table is given below showing a com-

parison of Pará and scrap prices for every year since 1895:

	PRICE OF FINE PARA RUBBER.		PRICE OF SHOE SCRAP.	
	Low.	High.	Low. cents.	High. cents.
1895.....	$0.70	$0.815	4.25	5.25
1896.....	.71	.85	3.50	5.25
1897.....	.795	.89	4.00	5.17
1898.....	.82	1.06	4.375	6.375
1899.....	.91	1.10	5.175	11.00
1900.....	.83	1.115	6.25	11.00
1901.....	.76	.95	6.50	9.25
1902.....	.66	.92	6.625	8.25
1903.....	.78	1.13	6.625	8.00
1904.....	.89	1.32	5.25	6.95
1905.....	1.13	1.35	5.70	9.375
1906.....	1.16	1.28	5.75	10.30
1907.....	.69	1.24	10.00	13.20
1908.....	.65	1.30	5.00	9.00
1909.....	1.13	2.15	8.25	10.875
1910.....	1.16	2.90	9.25	10.625
1911.....	.90	1.67	8.75	10.125
1912.....	.93	1.22	8.90	10.00
1913.....	.73	1.12	8.00	10.875

TAKING THE MEASURE OF THE LAST THIRTY YEARS.

THE National Civic Federation, a body of distinguished and disinterested citizens banded together for the general welfare, has embarked on an undertaking of great importance and of stupendous proportions. It plans to take such a comprehensive survey of the country as to enable it to show just what progress has been made in the past three decades in the material, mental and moral condition of the American people—to see if men, women and children are better off today than they were thirty years ago. This is a totally different matter from compiling statistics of the national wealth, the volume of manufactures, extent of exports and imports and increase in bank deposits. These figures are very readily obtained. The present inquiry is to determine if the average man—the average merchant, manufacturer, farmer, carpenter, clerk, teacher, hod-carrier—is getting more out of life than he did a generation ago. And the comparison is made with three decades ago because it is during this period that there has been such a tremendous output of effort by executives, legislatures, political parties, charitable organizations, the press, the pulpit and private philanthropists, to correct the faults, real or imagined, of former days. Socialism, semi-socialism and varying degrees of radicalism have all been busy in changing the old settled order of things. What has been accomplished? It is a gigantic question. If the National Civic Federation can answer it the world will be its debtor.

WISELY AWAITING THE RESULT OF THE TARIFF.

A RUBBER manufacturing company in New Jersey, mentioned in our news columns, some time ago planned to expand its plant by the addition of a tire department, but when the tariff as finally passed still retained the low duty of 10 per cent. on tires, the directors concluded to postpone their entry into the tire field. This was commendable wisdom. Doubtless in time—possibly in the near future—there will be room for more tire factories in the United States, but just at present the tire producing capacity of this country is rather in excesss of the tire consuming capacity, and a drop in the duty on foreign importations from 35 per cent. to 10 per cent. will without doubt tempt quite a number of the foreign makers to enter the field. Possibly their entrance into the American market may not be appreciably felt, and again it may—that remains to be seen. Under present conditions, it is certainly the part of discretion for new aspirants after tire business to wait and see how the game is progressing before plunging in.

THE TRANSPORTATION TAX ON THE RUBBER MANUFACTURER.

AN article entitled "The Rubber Manufacturer's Transportation Burden," which is full of interesting figures, will be found on another page of this issue. It contains some statements almost startling, but it was prepared for this publication by a writer of exceptional accuracy. Doubtless it will amaze many manufacturers to learn that, with all the vast transportation equipment of the country today, it costs as much to ship goods from the New England seaboard by rail direct to the nearer points of the middle west as it did seventy years ago when such shipments were made by way of New Orleans and up the Mississippi and Ohio rivers. The exorbitant railroad charges for short hauls are brought out in bold relief by the experience cited in this article of an exporter who filled an order for mechanical rubber goods from the Russian government. His freight bill on the goods from the factory to New York, a distance of 50 miles, was more than he was charged on the same goods from New York to a port in Germany 3,250 miles distant.

The auto truck, which, within reasonable distance, enables every manufacturer to control his own transportation, will undoubtedly compel the railroads to treat the short-haul traffic with much more consideration than has heretofore been the case; for in this particular field each road, generally speaking, has enjoyed a monopoly and exercised it to the limit.

WHY LEATHER SHOES?

HERE is another axiom to be added to the collection of the ages: A man's civilization is in inverse ratio to the amount of skin (or leather) clothing he wears.

Now see if that isn't so. The aborigine envelops himself in skins. That is quite natural. As long as he is in pursuit of game for the purpose of dining on its carcass, why not utilize its skin for clothing? As he progresses on the upward scale he learns the art of tanning and converts the skin into leather. As he becomes more civilized he substitutes garments of wool and cotton but still clings to skin caps and leather boots. When he yields to primitive impulses and goes on the hunt he puts on a leather jacket; and when he turns cowboy and rounds up the wild steers on the western plains he encases himself in leather breeches. But as he gets further and further away from savagery he discards all leather clothing except shoes. And why should he cling to leather shoes?

That is just what society is asking itself. Tradition dies hard. It has as much vitality as a bad habit. Men kept on wearing long-legged boots two and three generations after they had left the woods and the farms and gone into stores and offices. The leather shoe is a tradition, but it is a tradition that is getting harder knocks with each summer. The canvas shoe with rubber sole is doing it. And why shouldn't it? How much more comfortable, appropriate and sensible for summer wear is a light, cool canvas shoe with a light, buoyant rubber sole, than hot leather with stiff soles and jarring heels! The first canvas shoes manufactured were made for children, and especially for boys, and the reason of their appearance was largely one of economy. Then they were taken up, because of their suppleness and pliability, by those who engaged in athletic sports. And soon they commended themselves, by reason of their comfort, to the great body of citizens, irrespective of age and also irrespective of whether or not they ever attempted tennis or devoted their energies to golf. The canvas shoe appears earlier each spring and remains later in the fall. And why shouldn't it remain through the entire twelve months? Why seize the unoffending calf and do it to death to cover the human foot, when the cotton plant and the rubber tree can do it better?

THE ONE GREAT POSSIBILITY IN THE UTILIZATION OF RUBBER that appealed most to Charles Goodyear was its life-saving potentialities. He was inexpressibly distressed over the continuous loss of life at sea, and he applied himself day and night to devising the best sort of rubber life preserver. But rubber has recently been applied to a life-saving service that probably never occurred to Goodyear, even in the wildest flight of his imagination. Not only the medical profession, but the public at large has been greatly exercised of late over the number of fatalities from the accidental taking of bi-chloride of mercury tablets, and many people have busied themselves in the attempt to discover the best preventive. A Brooklyn doctor and a New York chemist have put their heads together and devised a rubber coating for the tablet, thick enough to withstand the acids and digestive juices of the stomach. To prove that they have succeeded in their quest the chemist recently swallowed a five-grain tablet so prepared and retained it for twenty-four hours without any injurious effects. Unless some better preventive is discovered it is quite likely that within a short time all bi-chloride of mercury tablets when sold over the counter will be equipped with a rubber coat impervious to stomachic influences.

CHICAGO HAS RECENTLY PASSED AN ORDINANCE REQUIRING that all motor trucks and delivery wagons be fitted with fenders within ninety days from the passing of the measure. It is not taken into consideration, however, what those concerns which will be unable to obtain suitable fenders in the allotted time are to do. The motor vehicle industry has been searching for a proper fender for the past two or three years, but the ideal device for this purpose has not yet appeared. The ordinance reads as follows:

"It shall be unlawful for any person, firm or corporation to use and operate within the city of Chicago any motor car or truck for the purpose of conveying therein bundles, parcels, baggage, merchandise or other similar articles unless said car or truck is provided with a fender, as in the case of street cars operated and used within said city, of such design as may be approved by the Board of Inspectors of Public Vehicles."

It is plain to be seen that it will be physically impossible to comply with the ordinance within the allotted time, since few such devices as those required have been designed and put into actual practice. A few of those fenders and bumpers which have been brought out have embodied rubber as a part of their construction, and if the above ordinance is to be complied with there is no reason why the rubber industry should not contribute its share toward the development of a satisfactory device. But even if a suitable fender should be introduced, it would be at least a year before it could be placed on the market in quantities sufficient to supply the demand.

What the Rubber Chemists are Doing.

[Extracts from Recent Articles on the "Chemistry of Rubber," which have appeared in some of the Foreign Publications.]

IN the "Zeitschrift fuer angewandte Chemie," Volume 26, page 494, Ernest Deussen communicates a new method for "The Quantitative Determination of Sulphur in Rubber." The principle of the method is based on the fact that on heating sodium sulphate with sodium carbonate and filter paper in the presence of reducing gases, there is formed sodium sulphide. In the present application of this principle the rubber is treated with concentrated nitric acid, as a result of which a yellow nitrosit is formed which is soluble in a sodium carbonate solution. The sulphur has been for the most part oxidized to sulphuric acid. The mineral matter has been converted either to nitrates or sulphates, or in some cases has remained unaltered.

After the excess of nitric acid has been boiled off, sodium carbonate is added, which dissolves the nitrosit and neutralizes the sulphuric acid, with the formation of sodium sulphate. Those minerals which have been rendered soluble by the nitric acid treatment are precipitated as carbonates. The solution, therefore, contains only the nitrosit, sodium sulphate, and excess of sodium carbonate. This solution is filtered, evaporated to dryness, and the residue reduced with filter paper. The sodium sulphide formed is determined colorimetrically in the usual way. As a standard for this colorimetric determination there is used a sodium sulphate solution of known strength which has been evaporated and reduced under the same conditions as the sample to be analyzed. The reduction of the sodium sulphate to sulphide is not quite complete, there being formed small quantities of sodium sulphite and sodium thiosulphate. By using a sodium sulphate solution of known strength and treating it in the exact manner as the sample to be analyzed, the error incurred, owing to the incomplete reduction of the sulphate, is overcome.

The nitric acid used in the above determination must be distilled over barium hydroxide and only the middle fraction of this distillation accepted.

In the "India Rubber Journal" of October 18, 1913, H. Skellon, B. Sc., contributes a paper on "The Role of Polyprene Sulphide in Vulcanization." By polyprene sulphide the author understands the final interaction product of the rubber hydrocarbon and sulphur. Regarding the rubber hydrocarbon as $(C_{10}H_{16})n$, polyprene sulphide would have the formula $(C_{10}H_{16}S_2)n$. In the theoretical discussions of vulcanization this possible influence of polyprene sulphide has been disregarded. It would, of course, be most marked in the case of hard rubber where considerable polyprene sulphide is present. The author expresses the opinion, which is supported by experimental data, that sulphur is soluble in polyprene sulphide, and, furthermore, that this solubility is greater than the corresponding solubility of sulphur in rubber. Considering the reaction: Rubber + sulphur = polyprene sulphide, it is found that the initial reaction velocity is greater than the reaction velocity toward the end of the reaction. (This is ascribed to the solubility of sulphur in polyprene sulphide, which latter is formed in the reaction.) As a result, the concentration of the unchanged rubber and sulphur is altered, which would not be the case if the sulphur were not soluble in the polyprene sulphide. The fact of sulphur being more soluble in polyprene sulphide than in rubber also explains why hard rubber articles do not generally bloom, altho they contain a very large quantity of free sulphur. Blooming in soft rubber goods may be looked upon as the crystallization of sulphur from a supersaturated solution. Since sulphur is more soluble in polyprene sulphide and since hard rubber contains a much larger amount of polyprene sulphide than does soft rubber, a free sulphur concentration which would produce a supersaturated solution in the case of soft rubber goods, produces a solution which is not supersaturated in the case of hard rubber. Accordingly, blooming does not take place, even tho a large amount of free sulphur be present.

It is probable that when sulphur dissolves in polyprene sulphide, polysulphides result, as is the case when sulphur is dissolved in inorganic sulphides. It is therefore very probable that polysulphides of polyprene sulphide exist in vulcanized rubber goods.

In the "Gummi Zeitung," Volume 27, page 1906, Felix Jacobsohn contributes a paper on "The Determination of the Mineral Matter in Rubber Compounds." It was recently suggested in Germany to use a solution method as the standard method for the determination of mineral matter in vulcanized rubber goods. Kerosene (B. P. 230 to 260 deg. C.) was suggested as a suitable solvent, tho in some cases camphor oil or paraffin oil would be found to be more effective. The author found on working with paraffin oil that results too high in mineral matter were very frequently obtained. This erroneous value, he suggests, is probably due to the carbonization of the rubber which takes place in the process of solution owing to the high boiling point of the paraffin oil. The carbonized matter being insoluble would be weighed up together with the minerals, and accordingly a value too high would be found for the latter. The same compound which gave too high a value with paraffin oil was also analyzed, using camphor oil as a solvent. In this case values much too low in mineral matter were obtained. The same held true with a mixture of ¼ of paraffin oil and ¾ of camphor oil. Satisfactory results were obtained, however, by using a mixture of 2/5 paraffin oil and 3/5 camphor oil. It should be noted that the above considerations all refer to the same compound which contained 33 per cent. rubber. For a rubber compound containing 50 per cent. rubber, it was found that equal portions of paraffin oil and camphor oil give the most satisfactory results.

In the "Gummi Zeitung," Volume 28, page 7, H. Loewen contributes an article under the same title as Jacobsohn's article. This investigator finds in the majority of cases that the utilization of paraffin oil as a solvent gives satisfactory results. However, in one particular case excessively high values were obtained for the mineral matter as determined by this method. It was observed during the heating of the rubber with the oil that after some of the rubber had gone into solution a peculiar flocculent substance separated out from the solution and subsequently settled together with the mineral matter. This substance was evidently rubber which had once been in solution and for some reason had subsequently become insoluble. In order to investigate this matter more closely, experiments were carried out with unvulcanized rubber. A qualitative experiment was carried out by heating 0.1 grams plantation crepe with 2½ c. c. paraffin oil at 170 deg. C., till the rubber was completely dissolved. The solution was thereupon heated for several hours at 230 deg. C., altho by this treatment the solution was not markedly affected. On increasing the temperature, but keeping it below the boiling point of paraffin oil, brown flakes immediately separated out of the solution. The heating was therefore discontinued, and these flakes were found to be soluble in benzol, but on continuing the heat treatment they no longer were benzol soluble. By using a mixture of equal parts of paraffin oil and kerosene (B. P. 160 to 260 deg. C.), the separation of these brownish flakes was not obtained.

Jacobsohn found that paraffin oil gives too high a value and camphor oil too low a value, while certain mixtures of these two oils give satisfactory results. In view of the above observations, Loewen suggests that these apparently accurate results are merely due to the counter balancing of the positive and negative errors.

Fifty Square Miles of Rubber Trees.

THE GENERAL RUBBER COMPANY'S VAST SUMATRA PLANTATION.

IN the first photograph shown below it will be noticed that there is quite a rise of ground—one might almost call it a hill—in the foreground. If one were standing at the top of that little elevation he could see a sight impossible to duplicate anywhere else in the world. He could look down through continuous avenues of *Hevea Brasiliensis* trees for seven miles. If he were to visit that same spot four or five years from now he would undoubtedly be able to look through avenues of rubber trees twenty miles long. But that is a later story.

This view is in the center of the great rubber plantation of the Holland-American Plantation Co. of Amsterdam, a subsidiary of the General Rubber Co., of New York, which, as is known to the trade, is the company that supplies all the crude rubber to the United States Rubber Co. and in a general way is under the control of that great organization. This plantation, which comprises 85,000 acres, already has 34,000 acres of rubber trees, or over 53 square miles. The vast scope of this enterprise and the great dimensions it has already assumed have made this plantation the cynosure of the trade and focused upon it the attention of the rubber growing world. There is nothing else in existence comparable to it in size. The Malacca plantation, which is the next in acreage, has 15,000 acres planted to

VIEW TAKEN FROM HILL, FROM WHICH 12,000 PLANTED ACRES CAN BE SEEN.

rubber and has hitherto been looked upon as a probable record maker for many years. But that is already a distant second. Perhaps a clearer conception of the size of this plantation may be obtained by stating that the planted acreage is already two and a half times the size of Manhattan Island. To a New Yorker, at least, that is very convincing, as the true Manhattanite believes that there are very few things in the world larger than his island. Or to put it in another form, if the 4,000,000 trees now on the estate were planted in a row, 19 feet apart—the shortest distance between any two trees in the plantation—they would reach 14,000 miles, or farther than from New York to Sumatra. And all this great enterprise is the result of less than four years' work.

It will be remembered that in the spring of 1910 the price of crude rubber soared to the three dollar mark, but for eighteen months before that time it had been climbing with a rapidity most inauspicious for the manufacturer. It was most natural, therefore, that the directors of the United States Rubber Co. should ask themselves why it was necessary for a great manufacturing organization using from one-fourth to one-third of all the crude rubber coming into the United States to be at the mercy of the capricious *seringueiro* and the almost equally irresponsible

MAP OF SUMATRA.

Square with Pointing Arrow Showing Location of the Holland-American Plantation.

aviador. It was natural that they should ask themselves why, with their great manufacturing and distributing system, they should not extend their organization until they controlled rubber from the ground up, or, to grow alliterative, from the soil to the sale.

They concluded it was worth investigating, and they sent Mr. Edgar B. Davis—who in his private travels had visited the Middle East extensively and was already quite familiar with that part of the world—over to the Malay Peninsula and the adjacent territory to reconnoitre. Obviously this was an enterprise that required not only American gumption but the best local experts, thoroughly at home in plantation matters. Con-

JUNGLE BEFORE CLEARING.

sequently there were associated with Mr. Davis two of the most eminent authorities on plantation matters in the Middle East, Mr. W. J. Gallagher, Director of Agriculture in the Federated Malay States, who had devoted several years to the

most minute inspection of the possibilities of the Malay Peninsula, and also Mr. H. Ketner, a native of Holland, who had had twenty-two years' experience in rubber planting. These

MONARCH STUMP PULLER IN OPERATION.

two men, familiar with the conditions necessary for successful plantation enterprises, together with Mr. Davis, spent many months in careful examination of the rubber possibilities of the Peninsula and of the various adjacent islands, and they finally selected a spot on the northeastern shore of Sumatra as offering altogether the most favorable conditions. Their selection was further investigated by a number of men qualified for the task, and their choice approved; and in May, 1910, the first purchase was made, when the company bought the Soengei Sikassim estate, owned by the New Assahan Tobacco Co. of Amsterdam. Subsequently they purchased nine more contiguous estates, until they owned in one piece—tho irregular in shape—a tract containing 133 square miles and measuring 30 miles across its greatest length and 20 miles across its greatest width. This tract is 17 miles back from the port of Tandjang Bale and 105 miles south from the city of Medan, a place of 27,000 population, where the General Rubber Co. has a branch house under the management of J. W. Bicknell, a former resident of Malden and a graduate of Harvard.

They selected this location for two reasons: It was proved to them that rubber plantations already started in that part of Sumatra were giving wonderful promise of success. In addition to that fact, the estates which they purchased had been used for tobacco and much of the land partially cleared. In fact the entire tract contained over 175 miles of well-built roads and was well drained. They could begin planting, therefore, immediately, without the delay at the start of having to clear every acre.

The planting was begun in June, 1910, only one month after the initial purchase; and the speed with which it was pushed may be inferred from the fact that in one single month 5,000 acres were planted. The plantation managers assured the directors of the home company that they should have rubber from their own plantation in five years' time, but the growth has been so rapid and healthy that the company is now assured of rubber from its own planted trees in less than four years' time. Another estate, in the Sultanate of Langkat, a little to the north of Medan, containing 2,500 acres, was acquired by the company, and rubber will be received from this estate this fall.

Mr. Davis, who is at present in New York but expecting soon to return to Sumatra, is exceedingly enthusiastic over the outlook. He believes that his company can compete with any rubber producers in the world, and he assigns various reasons. In the first place, the soil is of a volcanic, alluvial character, perfectly adapted to rubber growing. The rainfall, which is from 70 to 100 inches a year, is distributed through the whole year, even the hot months of summer having many days of rain, so that tapping can be carried on continuously through the year.

Moreover, the labor situation is as favorable as anywhere in the rubber growing world. Labor is cheaper than in the Federated Malay States and, while not quite so cheap as in Ceylon, is said to be more efficient. There are 11,000 coolies employed on the plantation, 3,500 of them being Chinese and 7,500 Javanese; and it is believed that by reason of the economy of handling this great body of labor as a unit, under one management, it will be possible to produce rubber on this plantation at a lower figure than is possible in almost any other spot. The organization of this great army of laborers is perfect. The head manager of the entire estate, Mr. Ketner, has under him ten managers, one for each of the ten divisions of the plantation. Each manager has five or six assistants, all Europeans but who can talk in the language of the coolie, which is Malay. Each assistant has under him eight or ten captains, or "mandors" as they are called in Javanese, or "tandils" as they are called by the Chinese. These captains are placed over groups of from twenty to fifty coolies. So that there is a continuous current of responsibility, from the humblest coolie getting 16 to 20 cents a day, up to the managing head of the whole enterprise.

ONE-YEAR-OLD TREES.

It may be a new thought to a good many people to learn that the topography of this estate also adds considerably to the efficiency of its management, but such, as a matter of fact, is the case. In many estates where the land is of an undulating nature, with little hills and small intervening valleys interspersed, it is very difficult to get a general survey of any large section, and for that reason it is not always possible for the manager or his assistants to discover just how industriously the coolies are keeping at their work; but in this estate the greater part of the land is either flat or on a gentle slope, and thus it is possible to get a view of vast tracts of the plantation, so that many groups of coolies can be kept under inspection by a single observer. This is a distinct advantage, which will contribute its share to low cost of production.

The managers do not rely entirely upon constant surveillance, however, to get the maximum of work out of their employes. They rely quite as much on getting and retaining the good will of the laborer. And with this end in view they are constantly looking after his welfare. They are building at the present time a hospital with accommodations for 600 patients and equipped with everything that makes for the quick recovery of

those who are its temporary inmates. Nor does their interest stop here. Everything is done to keep the laborers contented

THREE-YEAR-OLD TREES.

and happy, even to the extent of supplying them with instructive and diverting amusements which they appreciate thoroughly.

One of the photographs reproduced here by way of illustrating the work of this plantation shows the coolies in the act of extracting a root of one of the jungle trees. This plantation, notwithstanding its size, is one of the cleanest and best kept in the East, the managers believing that the initial expense of pulling out stumps and roots, tho large, is warranted by the ultimate result. No serious pests and diseases have appeared, but the disease most dreaded, *Fomes semitostus*, usually finds its habitat on dead stumps and roots, and it is to obviate the possibility of losses from this fungus that the stumps and roots of old jungle trees are being removed. The trees have been planted 121 to the acre, with the view of bringing 100 trees into bearing, but so free have the plantations been of disease that the management expects to bring practically 100 per cent. of the trees into bearing. Mr. Davis contends that it is perfectly possible, through proper management, to avoid practically all these fungoid diseases.

CONSTRUCTING A ROAD ON THE ESTATE.

A little north of this tract there are a number of flourishing English and Dutch plantations ranging in age from one to seven years, many of them producing 300 pounds or more to the acre. The Holland-American people expect easily to live up to this average and anticipate inside of the next few years an annual product from the 34,000 acres now planted of 10,000,000 pounds. There is this additional feature to be mentioned, that this vast amount of rubber, being made entirely under one management, will be uniform in quality, a condition the absence of which has hitherto greatly militated against the manufacturers' appreciation of plantation rubber. But, even with its great supplies, it is obvious that the company will have no rubber to sell, so it will be in no way a competitor of the other planting enterprises; while, on the other hand, the operations of this American plantation, conducted as they are on a scale never before attempted or even dreamed of, will be watched with the keenest interest by every planter, big and small, in the entire East—and they cannot fail to prove of the greatest value, in the lessons they will teach, to the whole rubber planting world. It is the purpose of the directors of the General Rubber Co. to co-operate fully with the planters in the East to the end that the industry may be put on a still sounder and more secure basis.

FOREIGN REGISTRATION OF AMERICAN TRADE-MARKS AND PATENTS.

Vice-Consul General Clarence E. Gauss, stationed at Shanghai, China, in a report published on October 30, calls attention to the need for registration by American manufacturers of their trade-marks and patents in competing countries. He states that China has no trade-mark or patent laws, altho the government has undertaken to inaugurate such systems, adding that the difficulty in the matter of infringements does not generally arise among the Chinese, with whom the authorities are usually prompt to deal in cases of infringement, but with certain European and Oriental manufacturers who put on the Chinese market merchandise which it is claimed by representatives of American manufacturers violate American trade-mark and patent rights. It is difficult to deal with such cases for the reason that not infrequently the American manufacturer has neglected to register his trade-mark in the country where the spurious articles are manufactured.

FOREIGN TRADE OPPORTUNITIES.

A foreign business firm informs the American consulate-general at Singapore that it would like to get in touch with a reliable firm to represent it in the United States. The firm states that it is in an exceptionally favorable position as regards the rubber trade, and believes that direct buying of rubber at Singapore will effect a considerable saving to American purchasers. The number of the consular report containing this information is 11,972.

An American consul has received an inquiry for the names of manufacturers in the United States of machinery for insulating electric wire. Replies should be accompanied by description and prices, all in Spanish. Report No. 11,950.

A new golf course—the second to be laid out in Portugal—is now being built by the government of that country, at Belem, near Lisbon, and will be opened this year. The fact that none of the stores in either Lisbon or Oporto—the location of the other course—carry golf supplies, and that the supplies which are introduced with the opening of this new course will have an advantage over those that come in later as adherents of the game increase in number, suggests an opening in Portugal for manufacturers of golf balls. The Bureau of Foreign and Domestic Commerce at Washington is able to supply lists of sporting goods dealers in both of these cities.

NEW YORK COMMERCIAL CO. DIVIDEND.

A dividend of 15 per cent., payable on December 1, was declared November 19, by John J. Townsend, of 45 Cedar street, referee in the bankruptcy proceedings of the New York Commercial Co. Mr. Townsend at the same time said that another dividend of 10 per cent. would be declared soon.

Rubber Notes From Singapore.

By Our Special Correspondent.

PERHAPS in my letter of last month I did not emphasize the reasons for my belief that Singapore is to be the future world's market for Pará rubber. The economy of direct buying I think I made clear. Now as to the city as a commercial center, and particularly as a rubber center:

In the first place, it is a free port with the best of shipping facilities, warehouses, banks, etc., etc. It is also a big city—225,000 inhabitants. Further, it is in the center of the great planting districts where there are already more *Hevea* trees than in all of the rest of the world. I have asked THE INDIA RUBBER WORLD to prepare a map showing just how central it is in regard to planted rubber. Within touch of it are some 1,500,000 acres.

Singapore will undoubtedly be of the utmost importance and interest to you in the near future, because it is the natural center of the rubber planting industry in the mid-East. There are altogether some 1,500,000 acres of planted rubber out here, of which about 700,000 acres are in the Malay Peninsula, 60,000 acres in South India, 30,000 acres in Burmah, 240,000 acres in Ceylon, 208,000 acres in Sumatra, 200,000 acres in Java, 60,000 acres in Borneo, and some 30,000 acres elsewhere. The Java areas are very uncertain and inaccurate, and contain many thousands of acres of odd lots—*Ficus, Castilloa, Ceara,* etc., —which are of no earthly use here commercially. Few of the Java properties are of any value at all as rubber estates, being mainly coffee, tea, and tobacco estates, with some rubber. Outside of possibly 60,000 acres, no one considers Java seriously, as the yield of the best is none too good there, tho labor is very cheap.

Deducting the 300,000 acres in Southern India and Ceylon, the produce of which all goes to Colombo, the natural center of all the rest, which one might call Malayan rubber—1,200,000 acres—is Singapore, and to Singapore it will shortly come, nearly all of it, for disposal in an open market, which will be of the utmost importance to the United States of America.

PLANTING IN THE PHILIPPINES.

It has been recently suggested to me by an American that I should go to the Philippines with a view of encouraging the planting industry there. This can only be done by attracting capital there from America, and I think that the only way to do this would be to go straight to headquarters in New York. I have studied and planted cocoanuts for many years, and recently private capital was raised for cocoanut planting in a carefully selected region in East Malaya, on a large scale, based on my estimates. I am convinced, however, that cocoanuts in the Philippines, if properly planted and administered, would do extremely well, and would bring in as much revenue in the future as rubber; *i. e.*, about 20 per cent. to 25 per cent.

Certain parts of the South Philippine Islands are very suitable for rubber, so that any American manufacturing company which would like to have its own plantation would do well to start there.

MAP SHOWING SINGAPORE'S CENTRAL POSITION IN EASTERN RUBBER PRODUCTION, PRESENT ACREAGE AND ESTIMATED YIELD FOR 1913.

RUBBER PLANTING IN CENTRAL AMERICA.

I believe that a good deal of American capital has been recently put into planting projects in Central America. I would very strongly advise against this in most cases, as you have not got the abundant cheap labor that we have, averaging 20 cents gold per day, nor the labor discipline, nor the trained staffs, etc. A great deal of good money might be saved by sending really

competent men there to report and advise. There are plenty to be had here—men who have managed estates that have been paying dividends for years. I don't think that many American-owned properties in Central America have paid any yet, so I leave you to draw your own conclusions. As a matter of fact, a great many of the men you have had in charge have had no real knowledge at all of their business, not being planters.

This is a very great pity, as it will tend to discourage tropical enterprise in America. Most of the mistakes are made in the estimates of probable results. I have seen the wildest and most improbable statements made *re* some of these enterprises, and they are all systematically undercapitalized—as far as working capital goes. The costs of working are also grossly understated. There is plenty of money to be made in tropical planting, properly organized and carried out, so that it is a pity that more businesslike methods have not been employed. We have been at the game for generations here, and really know something about it, and we do not like to see our neighbors exploited in the way that you have been.

THE WATERHOUSE CO.'S NEW CONCESSION.

One of the most interesting of recent developments in the Malay Peninsula is the acquisition by the Waterhouse Co., of Honolulu—of which Albert Waterhouse is the president and Fred T. P. Waterhouse the secretary—of a tract of 25,000 acres in Johore, near the River Endau on the east coast of the peninsula, and not many hours distant from Singapore. It will be recalled by people familiar with rubber planting in the middle East that the Waterhouse brothers were the first Americans to go into the planting of *Hevea* in this section. They have had two rubber plantations for some years, but they are now planning something on a vastly larger scale. Their concession is described by the experts who have seen it as being extremely valuable, consisting of undulating country with rich soil on excellent harbor, the land near the water being well adapted to cocoanuts, while that a little farther back is said to be admirably suited to rubber. They have formed a company called The Endau Development Co., for the purpose of opening up, clearing, and properly developing this great tract.

The possibilities of rubber planting in the middle East were brought home to the Waterhouse brothers by the series of letters on that subject written by the editor of THE INDIA RUBBER WORLD when he visited the middle and far East in 1905. On reading these letters, they entered into communication with Mr. Pearson, and secured his permission to reproduce this matter for distribution among those who might become interested in Eastern planting. They reproduced these letters in convenient form and circulated a great number of copies, and this had the effect of calling general attention among Americans in the East to rubber possibilities in the Malay Peninsula and its neighborhood.

OPTIMISM IN SARAWAK.

By the way, a friend writing from Sarawak in Borneo takes a very optimistic view of the possibilities of that location. He writes: "There is no doubt that plantations in Sarawak give a bigger yield than in the Federated Malay States or Ceylon and this is due, I believe, to the huge rainfall we have here. I think we shall always be able to produce at a shilling per pound, and eventually when the trees get bigger, at 9 pence."

MR. F. CROSBIE ROLES ADVOCATES THE "CESS."

Mr. F. Crosbie Roles, well known to the rubber men of America, because of the prominent part he took in the International Rubber Exposition held in New York in the Fall of 1912, took a decided stand in a letter he sent a little while ago to the "Financier" of London in favor of a rubber cess—or, in other words, a general imposition of a tax on all rubber producers—for the purpose of developing new uses for crude rubber. He says: "I think it is generally recognized that a new industry, especially, needs exploitation. If Eastern rubber producers could obtain and administer a rubber cess, the prospect of over-production a few years hence would be pushed away into the remote future." He believes that that is by far the most effective way of insuring such a development of the manufacturing department of the rubber industry that it will not be outstripped by the production of the crude material.

OIL TRACTORS ON RUBBER PLANTATIONS.

Oil tractors are proving of great value on rubber plantations. In the dry season, when the ground in some plantations becomes so hard that a plow hauled by bullocks is of no value, the oil tractor does its work admirably. Harrows can be attached

TRACTOR AT WORK.

to it 10 feet wide, which destroy the weeds and grasses that are detrimental to the proper growth of the rubber trees, and plow up the ground, loosening the soil so that moisture is more readily absorbed and retained during the dry season. The item of fuel expense is quite inconsiderable in view of the large amount of territory these tractors can cover in a short time. They can be operated very easily in a plantation where the trees are as much as 15 feet apart.

PRACTICAL TEST OF WICKHAM SMOKE CURE.

The Ceylon Department of Agriculture has sent to London a consignment of 560 pounds rubber prepared by the Wickham

RUBBER PREPARED BY THE WICKHAM SMOKE CURE.

smoke cure apparatus in response to a request from Mincing Lane for a quantity sufficient for trial. An offer was made of 4*d*. per pound above the regular price of plantation at time of settlement. The accompanying cut shows the rubber prepared for packing.

The Coagulation of *Hevea* Latex by Smoking.

THE subject of coagulation is one that has been treated frequently and at length in these columns, but it is always an interesting topic and constantly receiving attention from the rubber experts, among whom is M. V. Cayla, who contributes a detailed discussion of this topic to a recent number of the "Journal d'Agriculture Tropicale." There is not much in his contribution that is strikingly new, but quite a little of it seems well worth reproducing.

One of the principal points he emphasizes is the question: What factors in the process of smoking produce the admittedly superior quality of Pará rubber so sought after in plantation rubber and which is generally attributed to the Amazonian method of smoking?

With respect to the comparative merits of Pará and plantation rubber, some English manufacturers, as a result of factory trials, have pronounced "Smoked Sheets" (sheets smoked *after* coagulation) to be as good as the best Pará. The author regards these cases, however, as exceptions, referring to the premium which Pará rubber commands, as well as to its loss in washing being four to five times greater than that of plantation rubber; a considerably higher scale of value being thus established for the Brazilian article.

THE COAGULATION OF *HEVEA* LATEX BY SMOKING.

Most of the processes for coagulating *Hevea* are, in fact, inspired by the Amazonian smoking method; in some cases pretty closely, but not entirely realizing it in any instance. Smoking may be regarded as a complex action, or rather a group of actions. In dealing with a material so sensitive as rubber to the slightest external influences, the most infinitesimal factor may possess importance.

The numerous effects which are developed in the preparation of "Pará Hard Fine" may be divided into three groups: Chemical, physical, and mechanical, which are described as follows by M. Cayla:

CHEMICAL EFFECTS.

This concerns the quality of the smoke. If my information on this subject is correct, a complete and systematic chemical study of the different kinds of smoke has not as yet been made; but details in regard to the fuel used will allow us some reflections.

The fuel consists either of palm nuts, of resinous woods or of green wood. There is, consequently, a certain diversity. I have mentioned these fuels in the order of the preference expressed for them by the *seringueiros* of the lower Amazon, who further show their preference for the nuts of the particular palm tree known as the *Attalea*, the *Maximiliana* and the *Euterpe*, and for the dry woods of the massaranduba and the pao d'arco. We cannot give the botanical origin of these woods, which appear to be quite plentiful; they are hard woods, usually of a yellowish or reddish color and heavily impregnated with resinous substances. The *seringueiro* collects his wood ahead and prepares it, splitting it into sticks. But there are regions that contain few or none of the necessary palms or the valuable resinous trees, consequently the *seringueiro* has a struggle to get them, so that there are considerable differences in the fuel used, not only in the various districts of the Amazon basin but even by the same *seringueiro*. Nevertheless, the smoking, properly conducted, always yields excellent results.

It is necessary, therefore, to determine whether in the smoke of these various fuels there is always to be found one or more essential substances which impart the quality, or whether this quality can be imparted by a whole series of substances belonging to the same chemical group and which are to be found, one or another, in the products of combustion.

It will be seen that it is dangerous to attribute to this or that constituent of the smoke the essential part in the coagulation or the determination of quality. It seems certain, however, that, as has often been stated, these fumes, in addition to their coagulative action, exercise a preservative effect by impregnating the coagulated gum with various principles, such as creosote, formalin, etc.

PHYSICAL EFFECTS.

Coagulation by smoking is a warm coagulation. The temperature of the smoke, obtained by holding the bulb of a thermometer at a distance of several millimeters (a millimeter equals approximately one-twenty-fifth of an inch) from the mass of latex spread on the *bolacha* (biscuit) is above 72 deg. C. (162 deg. F.); I would not be astonished if it reached 80 deg. C. (176 deg. F.). A considerable portion of the heat would be applied to the vaporization of the water contained in the latex.

MECHANICAL EFFECTS.

The masses of rubber coagulated by smoking are still far from possessing the properties of the commercial gum. The coagulum is of a light cream color, of medium elasticity and considerable plasticity. On pressing on the surface, the impression of the finger remains. Withdrawn from the action of the smoke, on cooling and expelling the water (and the substances which it contains dissolved or in suspension) the gum assumes a more and more firm consistency and the impressions disappear. Thus a *bolacha* (a biscuit of rubber), placed on the ground to dry, will not be round but flattened on one side; if it rests on a mat, it will carry the impression of the mat, etc. There occurs, little by little, an interior process that modifies the physical condition of the coagulum; while its volume is reduced, the water is eliminated and the gum turns brown, almost black, on the outside compared with the inside; which is said to be caused, at least in part, through oxidization by the air. This contraction may last for days and weeks. The work that is done by presses on the plantation is therefore executed spontaneously, but in this instance the operation is evidently much slower.

The arrangement in successive concentric layers, moreover, facilitates this spontaneous working. A layer B, in its contraction, causes pressure on the underlying layer A; the layer C, which lies over B, presses in turn on the latter. These two efforts are combined to act on the layer A; and so on. To the contraction belonging to each layer is added the pressure resulting from the contraction of the superimposed layer. The pressure to which the various layers are exposed is therefore not only slow, it is also progressive. Consequently, the form even of the *bolachas*, more or less regularly spherical or ellipsoidal, causes this normal pressure to follow a radial direction. And as we may assume that a good operator spreads on the ball sufficiently regular layers, each layer is subjected over its entire surface to a pressure distinctly regular in intensity and directed towards the center.

That which I have just described shows that there are several differences between the method perfected for pressing the rubber on the plantations and the Amazonian method, which may be characterized as slow, continuous, progressive and regular.

These observations, incomplete tho they are, enable us to understand how difficult it is at present to choose among all the factors we have considered (and possibly still others) those particular factors that play the determining part in producing the high quality imparted by smoking. We shall not be astonished, however, to find that the chemical properties of the Amazonian smoking process do not play so vital a part that we cannot use entirely different fuels and still get good results; nor

shall we be surprised to find that the physical and mechanical conditions of the coagulation, and the drying, also, all play a most important part.

Numerous explanations have been attempted with a view to making this superiority of the Amazon product comprehensible. One of the latest is that of Dr. W. Esch, who claims that the rubber manufactured in Brazil contains a smaller quantity of the salts pre-existent in the latex than the coagulum obtained in a mass by the addition of a coagulating solution—acetic acid for instance. This supposes that in the *bassia* (a sort of large metallic bowl into which is poured the latex that is to serve for coating the ball in the course of manufacture) there has been a beginning of the "creaming" so that the upper layers are richer in globules and the lower strata contain more of water and of salts. Dr. J. Huber indicates that he has never observed anything like this. I may state that this separation seems very improbable to me. The *cuya,* or cup, which the *seringueiro* uses to take from the *bassia* the latex for pouring over the ball, is plunged every minute into the mass of latex and insures a sort of continuous mixing.

We know, moreover, that if there are applied to the latex some of the effects produced by smoking, we obtain as a result inferior qualities—for instance, with acetic acid, with hot air or steam under pressure (Cross experiments), or by simple evaporation (old experiments by Wickham).

We see, therefore, that all the methods hitherto devised only slightly resemble smoking. Some are but remotely similar, such as the acetic acid process, in which only one of the chemical effects possible is realized, which can only play a certain part in the coagulation but not in the preservation, for here we operate cold, pressing the coagulum on the machine relatively quickly, and in the form of sheets, biscuits and blocks.

It seems to me that of the smoking machines thus far brought out the greater part are far enough from realizing the Amazonian process. According to the brief descriptions which I have seen, the Wickham apparatus is possibly that which most closely approaches it. The author believes that materials found in the East could play the same part as the fuel used in Brazil. I will not contradict this, inasmuch as I have stated that the fumes are sometimes produced by the burning of green wood of no special variety.

Nevertheless, will it be possible to replace, by a machine, the work of the *seringueiro?* I do not wish to maintain that smoking is a work of art; but it is, nevertheless, a trick, a knack to be acquired, an intelligent performance of the operator, who does not always work in precisely the same manner.

To obtain a well-coagulated ball, we require a determined fluidity of the latex. Too watery a latex cannot yield a good result. Fumes of a certain quality are also required (which the workman recognizes by their pale color), issuing in a jet of the desired strength. If these characteristics disappear he stops the operation and refills the stove with this or that fuel. The admission of air to the *bolhão* is regulated so as to promote or reduce the draught.

The *seringueiro* decides for each layer how long a time should elapse before he withdraws the ball from the effect of the smoke and dips it into fresh latex. This period is not always the same. I have noted variations from the normal period to three times as long for a small *plancha.* Only an experienced workman can appreciate at sight the requisite time. It is necessary, in fact, to cease smoking the gum when the layer has assumed a certain consistency; when, in other words, it is sufficiently but not excessively smoked. On this consistency depends, on the one hand, the good adhesion of this layer with that laid on over it; in other words, the future quality of the gum. The time that is taken to attain this consistency varies, according to the predetermined dimensions of the ball and the fluidity of the given latex, with the thickness of the stratum of latex (the *seringueiro* cannot always spread on the same quantity of latex) and with the temperature and composition of the smoke. The good workman rapidly recognizes all these factors and works accordingly. The adhesion among themselves of the various concentric layers which form a ball and which we can detach by tearing off (which constitutes, so to say, the commercial definition of "fine Pará") displays variations. This is due to the fact that the construction of a ball is not effected at one time, and that between the various stages of smoking there are intervals. If these intervals are of too long or too short duration the exterior layer—the last coagulated—will have undergone modifications more or less serious in its physical structure, inasmuch as these are effected spontaneously in time; the adhesion to the fresh coagulum which forms the immediate upper layer depends on this physical structure, and will therefore vary more or less.

All these details have their importance in coagulation by smoking as relates to the researches in the desire to industrialize this process. What is sought is not only a certain coagulation but a better quality of rubber. To realize this quality, we ask ourselves whether in reality a machine can replace human labor. And then again, can it be claimed that coagulation by smoke offers an economical advantage? Accomplished by one man it requires much time, an experienced handworker who is willing to work in the midst of fumes, which, highly charged with antiseptics, are injurious to the mucous membranes and the respiratory apparatus.

Moreover, while smoking insures a certain uniformity in the gum produced, it is, as a matter of fact, a very limited uniformity, for it is confined not only to certain rubbers but even to the output of certain *seringueiros.* This is due to multifarious causes which would take too long to consider. This tends in the meantime to sustain the opinion that coagulation by smoking is not very simple or very easy to accomplish.

On the whole, it is undeniable that coagulation by smoking confers on the gum altogether superior qualities, and in seeking the reasons we are reduced to hypotheses. As to knowing whether there is an economical interest in generalizing the process by mechanical means, experience alone can tell us what would be the increased value of the product and what would be the cost of treatment. But in the last few years these facts have been placed in evidence, viz.: that the smoking machines invented in Brazil are hardly to be seen, except in museums, and have not supplanted the ancient and primitive method, and that more perfect machines set up on some plantations in the Orient have resulted in disappointments. Finally, it is in Indo-Malaysia that the practice is spreading more and more of smoking the "sheets" and "crepes" after coagulation, and in some instances the method has furnished economically a product of very high quality.

TWO RECENT PATENTS FOR RUBBER CURING DEVICES.

In connection with the foregoing article, by M. Cayla, on latex preparation by smoking, it may be of interest to note that a recent issue of "Ceylon Observer" records a patent (No. 1312, dated December 5, 1912) issued to Francis Alban Byrne, on "Improvements relating to the coagulating and curing of rubber," in which the inventor proposes to subject the latex to the vapors of substances obtained from the destructive distillation of wood, such as wood-tar and (or) pyroligneous acid, heated in such a manner as to effect their complete and quick volatilization, the fumes thus created being brought by any convenient means into contact with the latex.

Another patent (No. 1352, dated June 14, 1913), issued to Leonard Gastrell and Owen Dunbar de Vos, applies to a machine for coagulating and curing rubber. The latex is contained in a suitable receptacle and a revolving drum is brought in contact with it so that a coating of latex adheres to its surface. This film of latex is exposed to suitable smoke or fumes to effect its curing, which is accomplished by a revolution of the drum in a smoke chamber. The film of cured rubber being then detached, the process is practically continuous.

THE RIO RUBBER EXHIBITION OF OCTOBER, 1913

FROM the very inception of the measures which culminated in the establishment of the government bureau styled the "Defesa Da Borracha," Rio has been the pivotal center of legislation affecting rubber. It was at that city, in the summer of 1911, that delegates from all parts of Brazil met to submit their views to the government. These views led to the subsequent legislation of January and April, 1912, one of the sections of which provided for triennial rubber exhibitions at Rio, the first of these to be held in May, 1913.

After several postponements, the Rio de Janeiro Rubber Exhibition has taken place. Originally fixed for May 13, it was first put off till September 13 and again to October 12. On October 11 (the day before the official opening) a private view was attended by Marshal Hermes Da Fonseca, President of the Republic of Brazil, accompanied by his staff, which included Dr. Pedro De Toledo, Minister of Agriculture, Dr. Pereira Da Silva, Chief of the Defesa Da Borracha, Adrimal José Carlos De Carvalho, in official charge of the exhibition, and various other officials.

Under the special escort of the officials connected with rubber, the President then made a tour of the exhibition, carefully studying each section.

The object of this preliminary official inspection was to enable each of the various members of the cabinet to acquire a personal knowledge of the connection between his department and the broad question of rubber and to determine in what way they could be of mutual service.

THE MONROE PALACE, RIO.

With a view to a more intimate exchange of knowledge as to their product by the separate states, there had been arranged at this exhibition samples of the different types and species of rubber produced in the various parts of Brazil. Information had been compiled as to cost of rubber lands, wages, climate, extraction and preparation of rubber. This information was so grouped as to afford comparative information about the various features of the questions now engaging the attention of rubber experts. The information also covered freights, taxes, duties, and complete data regarding the rubber industry. This printed matter was intended for the enlightenment of Brazilian as well as foreign visitors, and included diagrams and monographs.

An interesting feature was the examination by the President of the process of smokeless preparation of rubber, invented by Dr. Cerqueira Pinto, who claimed superiority for his process to any other for the purpose, excepting the metallic drum of Admiral José Carlos de Carvalho. The learned doctor said that the Brazilian government had already made a contract for the introduction of his process.

Of remarkable interest were the exhibits of sheet rubber from the states of Matto-Grosso, Amazonas and Pará, which supply a large part of the Brazilian rubber exports. Miñas-Geraes likewise had a good display, representing *Manicoba* and *Mangabeira* rubber. The large daily attendance at the Monroe Palace has furnished convincing evidence of the keen interest felt in the exhibition.

There has been a total absence of jealousy between the representatives of the East and the West, Dr. Pereira da Silva having accorded a place of honor to the collections of Ceylon and British Malayan rubber.

On the following evening, Sunday, October 12, the President of the Republic repeated his visit, for the purpose of formally opening the exhibition. The inaugural ceremony took place in the upper saloon of the Monroe Palace, before a select number of high officials and personages representing Brazilian society.

The President on ascending the platform was accompanied by Dr. Pedro de Toledo, Minister of Agriculture, who delivered the address, extracts from which are quoted below.

The cinematograph display gave a personal interest to the exhibit, illustrating the production of rubber in the various states of the Brazilian Republic.

Many ideas were suggested by this instructive exhibition, a goodly number of which will doubtless be realized at next year's London display.

The exhibition included sections demonstrating the cultivation and preparation of rubber and the manufacture of rubber goods. It presented a comprehensive display of the whole of the rubber industry as carried out in the producing states represented.

In a special pavilion were grouped a number of machines used in the manipulation and preparation of rubber, and, to a certain extent, for manufacturing. These machines all came from Great Britain.

The principal exhibits of machinery by English manufacturers were those from David Bridge & Co., Ltd. (two machines); Francis Shaw & Co., washing and drying machines; Robert Warner & Co. (two machines).

It would seem that the advantages of the exhibition were to a great extent not recognized by European manufacturers.

DR. PEDRO DE TOLEDO'S SPEECH.

On the occasion of the opening of the exhibition the formal address was delivered by Dr. Pedro de Toledo. In this address he pointed out that every industry has to encounter struggles before reaching greatness.

To use his own words:

"In the fantastic wilds of the Amazon Valley arose one day the industry of black gold. It went on thriving, at the loss of thousands and thousands of lives. Those nameless heroes, the rubber gatherers, amid the squalor that wasted their bodies, went

on toiling day by day, raising piles of wealth which have been spent on majestic palaces, pearls and diamonds.

"The successive governments, dazzled by the prosperity of the times, traveled as if blindfolded. The profits of the *Hevea Brasiliensis* industry filled the treasury, and it appeared inexhaustible. The markets of the world were controlled without competition and without comparison.

"With the sole end of realizing as much revenue as could be obtained, they increased the taxes on the product, rendering it dearer at ports of embarkation. And this revenue they devoted to all kinds of objects save the industry itself.

"While we stood still gathering and preparing our precious latex, other governments went on silently importing *Hevea* seeds, destined in a brief period to constitute those great forests of the East which have now entered into frank competition with our native wilds in supplying the world with our greatest export product."

After referring to the study of the rubber question as embodied in the recent legislation as a work of economic, political and social significance, he said:

"We propose to circumscribe the crisis, relying on time, the continuance of our policy already begun and on our confidence in our destiny as our chief elements of victory."

THE RUBBER MANUFACTURING INDUSTRY IN BRAZIL.

DEALING with the above subject in a paper read at the late Pará congress, Dr. Manuel Lobato contended that the international exchange of rubber, deviating from the general law of supply and demand, forms a special and complicated network of its own. It is the buyer who regulates prices, without regard to the quality of the article or the interests of the seller. The rubber trade, he added, is always at the mercy of periodical destructive crises, while living expenses continue.

Without a complete reform of mercantile customs, Dr. Lobato believes that it will never be safe to attempt rubber manufacturing in Brazil. The large factories producing these goods in other countries have immense capital, which he thinks would not be the case in Brazil. Small factories, with a reduced output, would not produce favorable results. While prohibitive duties are placed on foreign goods, those which are made in the country suffer from the disadvantage of high-priced labor and do not satisfy the consumer.

Regarding the anticipated orders from public bodies, Dr. Lobato does not approve asking favors from the authorities and prejudicing the interests of private contractors by making low offers.

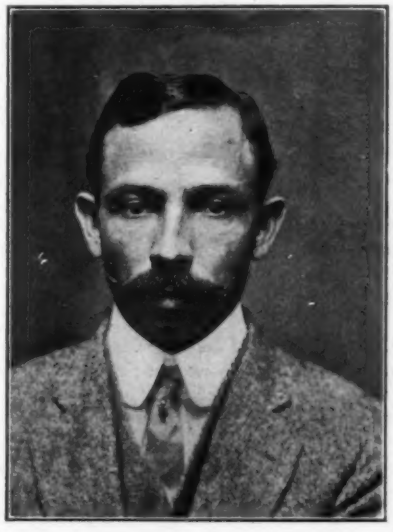
The speaker further said: "Establishment of the manufacturing industry does not seem to me advisable at the present moment, unless our commercial usages are placed on a more secure basis, under which capital may be absolutely guaranteed, or as nearly so as is possible by human legislation."

He summarizes his recommendations in the three following conclusions:

"1. The attraction of capital to the State is a necessity. This result, however, will never be possible without a complete reform of our commercial usages. On the other hand, the law must protect this capital by unquestionable guarantees, so that it may never be at the mercy of adventurers or unscrupulous parties.

"2. There is no doubt that the manufacturing industry will afford a favorable investment for capital, provided raw materials are used, which can be furnished by our Flora and Fauna. Success is only to be anticipated in conjunction with a more intelligent co-operation than at present exists.

"3. The industrial manufacture which depends upon imported raw material will never attain great success; by reason of the customs' duties—even tho slightly modified. Unless such



DR. MANUEL LOBATO.

modification were carried to a greater extent it would exercise no influence whatever.

"At present, we should not depart from the principle that an extensive cultivation of the soil should be urged, as being productive of immediate benefit to the State."

ADULTERATION IN THE RUBBER INDUSTRY.

AMONG the papers read at the recent Pará Congress was one of special interest by Senhor Leopoldo Penna Teixeira, dealing with measures for the prevention of adulteration and abuses in the rubber industry. In opening he referred to the decline of the brilliant but illusory prosperity of the Amazon valley. This fact he attributed to the restricted term of the successive administrations, to the want of continuity in plans, as well as to the individualism of public life.

With reference to the question of adulteration, the speaker quoted a statement received by him from Senhor J. Cohen, formerly the owner of a *seringal* and a merchant in the Island region, but at present retired from business. Mr. Cohen stated that he had long been investigating the real cause of rubber adulteration, for which task he enjoyed special facilities, owing to his relations with the merchants of Pará and the interior as well as with *seringueros*. From his knowledge of the situation, he asks whether adulteration is increasing as it did during the great crisis of 1900.

At that time several Pará commercial houses sent to their *aviadors* large quantities of wheat flour, to be sold to *seringueros* for the purpose of increasing the weight of their product, which was then sold to certain Pará buying houses as fine rubber. At that time, the cry was for "rubber and more rubber" of whatever description.

Another cause of fraudulent methods arose from discord between the owners of adjacent *seringaes*, which led to some local merchants advising certain *seringueros* to defraud in the quality and weight of their rubber, as it was sold to a competitor.

That such practices still continue is shown by the fact that in 1912 an English company in the municipality of Anajás received 4000 kilos of rubber which the Pará buyers would only accept as Sernamby, on account of the scandalous and gross adulteration. On this basis the representative of the English

company, through the good offices of the English consul, disposed of the rubber. According to Mr. Cohen, the parties chiefly concerned in this fraud were leading men in the politics of the locality.

Regarding the production of native *seringaes*, the speaker expressed the opinion that an absolute increase was only possible through a system by which the worker will contribute his contingent of labor regularly during the ordinary crop season. Each *seringal* should be worked a certain number of days, to be determined for each crop. Work should always be under contract, and not optional, the object being the regular and maximum production of the *seringal*.

In continuation, Senhor Teixeira urged that the transformation as far as possible of the bulk of the latex extracted, into high-grade products, and the methodical improvement of the unavoidable inferior types, call for the energetic action of employers. The necessity is urged of prohibiting by the necessary regulations all extractive processes injurious to the *seringueros*, and all systems of preparation impairing the characteristic qualities of rubber—elasticity, resistance and purity.

The suggestion is made for the Commercial Association to establish quotations for all new and old types of Pará rubber, so as to encourage the manufacture of the grades most in favor.

Other portions of this interesting paper deal with the proposed regulations as to Sernamby, the action of public authorities, the number of incisions per day, the character of the *machadinho*, the introduction of new tapping instruments, and other subjects of interest.

In his final remarks, the speaker said that much could be done to prevent these adulterations and abuses, which disturb the existence of the important export industry of Amazonia, if the responsibilities were rightly understood and rendered effective. This could be done by means of district committees, on which would be represented proprietors and lessors of *seringaes*. These bodies would look after the rubber industry, both as to cultivation and preparation, as well as to its industrial progress. They would make reports to the State Department of Agriculture as to local needs with statistics of existing *seringaes* and plantations.

DR. MULLER'S WELCOME HOME.

Prominent among recent events of international moment was the visit to this country of Dr. Lauro Müller, Brazilian Minister of Foreign Affairs. As chronicled in the August issue of the INDIA RUBBER WORLD, he returned to Brazil on July 16 on the warship *Minas Geraes*, taking with him the good wishes of his many American friends.

His reception at Rio de Janeiro was marked by appropriate festivities, in the course of which Dr. Miguel Calmon, in the name of the Reception Committee, delivered a cordial address of welcome. In this address he expressed "the sentiments of affection and respect entertained by friends and admirers for the illustrious Brazilian statesman who had returned home, crowned with the laurels bestowed on him by the greatest of American nations. Brazil was not alone in these expressions, being joined in them by the other South American powers."

Continuing his remarks, Dr. Calmon traced the public career of the minister and his connection with such statesmen as Rio Branco and Nabuco. He also referred to the work undertaken by Dr. Müller as president of the National Society of Agriculture.

In his concluding words, the speaker said: "Dr. Müller is one of the greatest realities of the present time, and one of the greatest elements of hope for the future. He is an honor to his country."

Official statistics show Brazilian imports for 1912 equal to $316,869,855, and exports $360,000,000.

SOME NEW TAPPING KNIVES.

PROBABLY as much depends on the method and efficiency of gathering the latex as on any of the subsequent plantation processes for the successful harvesting of a season's rubber crop. That designers realize this is demonstrated by the large variety of designs in tapping knives that have made their appearance on the market in the past. And new designs are still forthcoming, as is shown by the recently introduced tapping tools illustrated herewith.

Rubber experts long ago realized that the indiscriminate cutting and slashing of the bark only resulted in the death of the tree or in its greatly decreased capacity for yielding latex. It is for this reason that much attention has been given to the design of tapping-knives that will prick the bark of the tree to a proper depth and at the same time leave it uninjured. Two diagrammatical views of such a new tapping tool, designed by Adriaan J. M. Ledeboer, a planter of Kalisat, Java Dutch Indies, are shown in Fig. 1. In similar devices, the teeth have usually been broad and wedge-shaped. Owing to the breadth of these teeth, only a few could be employed in a row of certain length, so that only a limited number of incisions could be made. Also, the breadth of the teeth caused wide cuts. This new tapper or pricker comprises a row of parallel needles *A* secured in the holder *B* very close to each other. This holder may be of iron or wood, and the needles are set only about 1/16 inch apart and project about ½ inch from the holder. In using this tool, only those cells are pricked which are in the cortex, while the cambium remains uninjured. The wood underneath is also undisturbed, since it would be impossible, without great force, to press all of the needles into the wood.

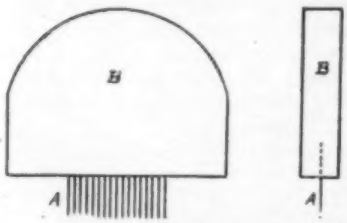


Fig. 1. THE LEDEBOER PRICKING NEEDLE TOOL.

Another new tool, which takes the place of the ordinary gouge for collecting bark parings, is shown in Fig. 2. Ordinarily, bark parings contain about 18 per cent. of pure rubber. A laborer will take off in an average day's work about one pound of parings, so that for every 100 laborers tapping, 18 pounds of rubber will be wasted if the parings are not collected. The cutter of this new tool is in the shape of a hollow tube, attached to a large hollow handle which acts as the bark collector. By taking off the parings with this instrument, the bark is prevented from falling to the ground. This prevents sand, gravel and dirt from becoming mixed with the parings and contributes to the life of the macerating machines, since a great part of their wear is attributed to the action of these foreign substances on the rollers. This tool is marketed by the Planters' Stores & Agency Co., Ltd., in the Malay States, Straits Settlements, and Ceylon.

Fig. 2. NEW BARK PARING COLLECTOR.

NEW GRADE OF BRAZILIAN SHEET RUBBER.

The "Revista da Associaçao Commercial do Amazonas," Manaos, states that Messrs. B. Levy & Co., the well-known exporters, have recently made a shipment to London of some 200 pounds of superior quality rubber from the Rio Madeira, prepared in sheets, according to the "Tamboir" system. It is added that shipments of this grade will shortly follow from other exporters.

THE RUBBER MANUFACTURER'S TRANSPORTATION BURDEN.

IN the winter of 1834, President Andrew Jackson, being in Boston, visited a rubber goods factory at Roxbury, where he was presented with a suit of rubber clothing, which he donned and wore throughout the day, which was rainy. South American rubber shoes had been on the American market since 1823, and sold at retail at from $3 to $5 per pair. Domestic rubber shoes had been on the market five years. President Jackson in speaking about rubber shoes and rubber clothing that day, said that "the use thereof could be greatly extended in the remote west and south but for the high cost of carriage, which was a great tax against manufacturers and consumers."

At that time, the population of the nation was 13,000,000; the centre of population was nine miles southwest of Baltimore; the railroad mileage was 238. Seven-tenths of the population lived along or within fifty miles of navigable waters. Manufacturing was being developed only at ports or along or near navigable rivers, so that products could be forwarded by sail or steam packets. In the early days of the rubber working industry in eastern New England, nearly all the shipments of finished goods for New York, Philadelphia, Baltimore, Richmond, Charleston, Savannah, Mobile and New Orleans went by packet sloops or schooners. Few of the schooners were over 200 tons burthen. Freight charges were very low as most of the packets were owned by the masters and mates and their neighbors, and it was before the days of plastering ships and railroads with a dozen kinds of interest-bearing securities. Even on rubber goods shipped from New England to New Orleans by sail packet, and thence to points on the Mississippi and Ohio rivers the rate was not, in years when competition was active in western freighting, as much as it is today by the pound or reckoned upon a basis of cubical content. But it was held then, as it is held today, that the cost of transportation is an enormous tax against producers and consumers.

The transportation tax, as it exists today under the nation-wide community of interest relations which exist between nearly all our railroads and coastwise, lake and river steamships, is seen every day in New England, the Middle and Western States, where many animal-hauled vehicles are used to carry inward and outward freight from five to twenty-five miles, because neither the railroads nor the steamboats, that are within a few yards of the highways, will give as low rates as the manufacturers can haul short way freight for, under the same methods in use by the people of Asia six thousand years ago. In parts of New Jersey, where the making of rubber products is a great industry, one can see horse vehicles owned by such concerns moving outward and inward freight to many points, where from the wagons may be seen the tracks of two to four trunk line railroads, and one to two canals. The railroads long ago got control of the canals, and closed one and ruined the other. As for way freight, they will not take it, except at extortionate prices, yet in that State, as in the other Middle States and in New England, hundreds of thousands of empty freight cars a year are moved past rubber goods and all other kinds of manufacturing plants.

It is a remarkable fact that the rubber goods factories of the nation are "bottled up"—as the railroad men's expression is—by the community of interest transportation lines, land and water—to the extent of 97 per cent. of their total number. That is to say, these plants and their warehouses in large cities, and the warehouses of the great distributors of rubber goods are at points where, in railroad phrase, "the freight charges are all that the traffic will bear."

Today the centre of the population of the nation is in Indiana, but a few miles distance from Chicago. This physical fact exhibits what a tremendous tax is transportation against the rubber working trades everywhere, but especially so in the Central West and in the Pacific Coast states. During six months of the year, there are daily on the tracks of trunk lines between the east and west, and especially between Chicago and St. Louis and far western points, at least eight hundred miles of empty cars, returning after having discharged food products, timber and minerals in the east. One would think that the operators of those lines would see the wisdom of filling those cars with manufactures carried at a low and yet profitable rate that would enormously stimulate the development of the far west. Of course the cost of hauling a million empty freight cars the average distance of 2,000 miles a year is charged off to the food products, mineral and lumber industries, and makes a part of the large increase in the cost of food to the consumers; and has thereby so reduced the spending power of millions that the consumption of dry and rubber goods and many other articles is less per unit of population than it was when competition existed in the transportation industries.

That "kissing goes by favor" among many of the communards of interest, when it comes to getting low rates for concerns in the manufacturing and exporting lines which they control, was lately exposed by a bright young man who was trained in the freight department of a great railroad, and who recently married a daughter of the chief executive of a rubber working corporation. This young man went into business with his father-in-law, and soon found, that in popular phrase, the concern and its customers were being "soaked" by the trunk line roads in a community of interest. He proved his statement by his first day's work in re-routing for Denver, whereby he saved the consignees $35.47 a car load from the regular scale they had paid. In another instance, he re-routed from a New England point to a city in central New York, cars on which the saving over the direct run charge came to $10.26 a car; the goods went by way of Canada, and by devious ways in the west, and then down to the point of destination.

A few days ago, a great local house in army and naval engineering supplies, booked a cablegram order from the Russian government for certain kinds of mechanical rubber goods. The ocean freight under which the goods were shipped—3,250 miles to a German port—came to a little less per 100 pounds than the freight on the same goods from a point just about 50 miles distant from New York.

The operation of motor trucks by many makers and distributors of rubber wares in the Eastern, Middle and Central Western states is being rapidly developed for zones of 25 miles radius—or thereabouts. Three and five-ton trucks are used; the velocities, under the best conditions, are from ten to twelve miles an hour. Last year, the average velocity per hour of all the steam railroad freight trains moved in the nation was but seven and three-quarter miles. In this the delays at switching and water and fuel stations are included. A considerable number of rubber goods manufacturers desire to use ten-ton motor cars but cannot do so because of the structural weakness of most of the highway bridges of the rubber working zones. The present writer has just gone over this ten-ton motor truck matter with the executive officers of a great rubber working corporation in New Jersey. He found by engineering tests, that ten-ton trucks could not be used at many places in that State, because of the extreme weakness of highway and canal bridges. In fact, five tons is a tremendous strain upon the best of the highway bridges in that State, and few of the Canal bridges are safe when three-ton motor trucks cross them. By making detours, a considerable number of motor trucks owned by rubber working concerns are being operated between New Jersey plants and New York City and vicinity and between those manufactories and Philadelphia and vicinity.

The railroad communards of interest, through means long used to bring legislators to their way of thinking, are hindering or stopping the improvement of highways and the strengthening of

highway and canal bridges everywhere, in order that the motor truck way of escaping from slavery to extortionate way freight rates may not become an important factor against the "bottlers up" of most of the railroads.

SYNTHETIC RUBBER FROM TWO ASPECTS.

SYNTHETIC rubber has to be considered under two aspects, technical and economic. The technical aspect has been fully treated in scientific literature and to a certain extent in the general press. The attention which was aroused by the discoveries of Harries, Hoffmann, Perkin, Fernbach and others, will be recalled.

ECONOMIC ASPECT.

With regard to this branch of the subject, an interesting communication has recently appeared in the "Bulletin of the Brazilian Bureau of Information in Paris." This article follows up a discussion of the question which appeared last year in the columns of the "Jornal do Commercio" of Rio de Janeiro.

In the first place, a distinction is made between "synthetic" and "artificial" rubber. The former must be identical with natural rubber and instead of being a vegetal production must have been created from raw material and possess the same chemical composition as the natural gum. Factitious or artificial rubbers consist of substances analogous to india rubber, but which have only certain characteristics in common with it. They contain no trace of india rubber, either when used separately or as an admixture with "real rubber" for manufacturing purposes.

WHAT IS REQUIRED OF A SYNTHETIC RUBBER.

In order to successfully meet the natural product, synthetic rubber must compete in both price and quality. Of all the various processes tried, that of polymerizing isoprene or carburet of hydrogen has proved most successful; but the essence of turpentine from which the isoprene is derived is a very expensive material. Very few patents, it is added, deal with any raw material cheap enough to be practically useful.

QUALITY OF SYNTHETIC RUBBER PRODUCED.

That, apart from the question of cost, synthetic rubber has been produced in the laboratory, is admitted to be the case; but the quality of such rubber has considerably varied. In some cases it has been hard and inelastic, while in others it has come up soft and plastic. Some of the samples have been fairly elastic when first prepared, but oxidize rapidly in the air, becoming "sticky." Few of them, as far as the "Bulletin's" knowledge goes, are able to stand the first stages of the process of manufacture.

"The fact, however, remains," it is added, "that synthetic rubber has actually been produced, and the numerous chemists who are investigating the problem may sooner or later discover a means of improving its quality, while at the same time reducing the cost of production."

ACCORDING TO TELEGRAPH REPORTS, the German Secretary of State, Dr. Solf, who has recently visited Southern Cameroon, has refused to consider the abolition of the export duty on crude rubber (9.52 cents on 2,240 pounds), shipped from Cameroon, much to the disappointment of the producing interest. A memorial requesting the removal of the tax, in view of the unprofitable condition of the trade, has been addressed to the State Department by the Berlin Chamber of Commerce. An urgent memorial on the subject has also been forwarded to the government by the Economical Association of the northern district of German East Africa, in which the present unfortunate condition of the rubber interest of the colony is very forcibly stated.

SUMMER BOB-SLEDDING WITH RUBBER TIRES.

THERE are certain places in the Alps where bob-sledding is a famous sport, but under normal conditions this is a sport that is confined to winter. A certain devotee of this pastime, however, has conceived an idea by which it may be enjoyed quite as well in July and August as in January and February. He

SUMMER BOB-SLEDDING IN THE ALPS.

has constructed a bob-sled like the ordinary sled except that in place of runners it has wheels, about the size of bicycle wheels, with pneumatic tires; and this sled coasts down the Alpine slopes as rapidly as it would in winter on the customary runners. In short, the coasters, instead of slipping over the snow, ride on air, with results that are said to be highly satisfactory and under conditions rather more comfortable than those that obtain in the Alps in midwinter. The accompanying illustration is taken from "The Sphere" of London.

COTTON CONSUMPTION OF THE WORLD FOR ONE YEAR.

Of the world's consumption of cotton for the year ending August 31, 1913, amounting to 20,277,386 bales (a bale being 500 pounds), 13,760,261 of this number were American; and of stocks on hand at the close of the year amounting to 3,540,771 bales, 1,622,366 bales were American. The total number of cotton spindles in the world is estimated at 143,452,659, and of this number 129,895,651 spindles (64,325,243 mule and 65,570,408 ring) were in work during the year, 21,149,839 spinning Egyptian cotton, and 108,745,812 spinning all other kinds. There are also reported in course of construction 2,563,544 additional spindles, almost half of these in Great Britain, the remainder divided between Japan, Germany, Russia, Canada, Sweden, France, Austria, India, Belgium, Norway, and Italy, in the order given.

Rubber Hose in the Machine Shop and Foundry.

PROBABLY no other branch of the rubber industry combines such a diversified list of uses as does that of rubber hose. At first glance this would seem to be a subject easily covered in a few short paragraphs, but when we stop to consider for what extensive and varied uses rubber hose is employed in air compression machinery alone, without taking into account its now indispensable employment in pneumatic tools such as riveters, drills, grinders and sand blasts, as well as in many other lines, it is easily seen that this is by no means an unimportant subject.

Rubber hose first came into use by virtue of its flexibility, and it is this important factor that makes it invaluable in many ways as a means of transporting such substances as air, water, steam, gas, sand, etc., to the points where they are to be used.

In the machine shop, perhaps, is seen the greatest variety of different classes of work in which rubber hose is used. Upon entering any engine repair shop of a railroad, for instance, one of the first things that attracts the attention is the b-r-r-r-r of a pneumatic riveter. Less than ten years ago nearly all riveting in boiler and engine shops was done by hand, but this has been gradually superseded by the more modern compressed air riveter. Such a riveting machine is held in the hands of the operator, and the hammer directed against the tail of the rivet at any desired angle. If it were not for the part which the rubber hose contributes to this important factor in engine and boiler building and repairing, it is easily seen that the scope of the pneumatic riveter would be extremely limited. But for the aid of flexible hose only such small work as could be easily handled would be subject to the advantages of this style of riveter, for the work would then have to be taken to the machine instead of taking the machine to the work.

The pneumatic riveter is used almost altogether in modern shops devoted to the manufacture of boilers and tanks of all descriptions. In such shops, where a number of riveters are constantly in use, it is necessary to install a storage tank in which

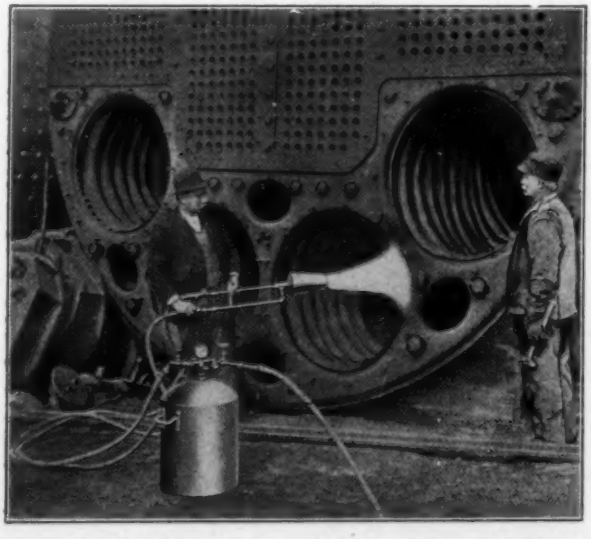


FIG. 1. THE ROCKWELL PORTABLE HEATER IN BOILER SHOP WORK.

the air is compressed by means of an electric or steam-driven compressor. From the tank the air is usually distributed around the walls of the building through iron pipes which are tapped at various points for making connection with the rubber hose. The same or a similar arrangement is also used in pneumatic installations for nearly all other purposes, while air for operating riveters, drills, sand blasts, blow torches, etc., may be taken from the same pipe line.

The pressure in the storage tank may vary from only a few pounds per square inch up to 200 or more, and the strength of the rubber hose must, of course, vary accordingly. A hose for pneumatic tool service must be light, strong and flexible to withstand intermittent pressures. It should remain free from kinks when bent in sharp curves and the lining or inner tube should be of heavy quality to protect the fabric. Hose of this type is built up of alternate layers of rubber and duck fabric, the latter varying from three to eight-ply; four and five-ply hose are the kinds most commonly employed in connection with machine shop tools. The demand for this type of hose has increased rapidly in recent years, due to the popularity of the pneumatic tool. For very high pressures the hose is usually armored with a coil of strong wire to support the walls of the tubing and prevent them from blowing out.

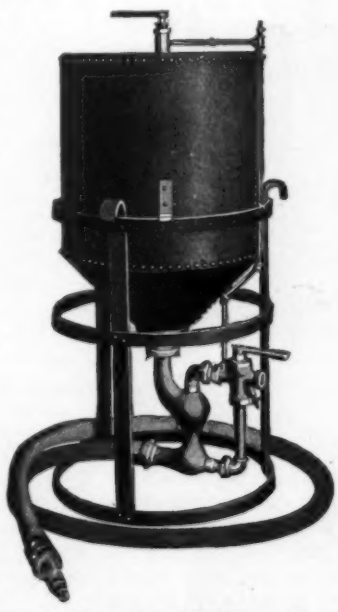


FIG. 2. DRUCKLIEB SAND BLAST WITH RUBBER HOSE ATTACHED.

It is sometimes much easier to take the tool to the work than to take the work to the tool, especially where moving the object which is to be worked upon involves heavy handling. Here, also, the rubber hose plays an important part. For instance, if it is required to drill a number of holes in a heavy piece of machinery which cannot be placed upon a drill press, how much more advantageous and labor-saving it is to simply attach a pneumatic drill to a hose and thus do the work in one-quarter of the time required by a hand drill. Many jobs which were formerly impracticable are now made easy and inexpensive through the introduction of the rubber hose in connection with the compressed air-driven drill. Hose for this purpose is of the same type and construction as that for the pneumatic riveter, the size and ply varying with the air pressure and size of the tool.

For conveying both steam and water in the machine shop and foundry the rubber hose has made itself indispensable. Every one knows the great variety of purposes for which water hose is used in the shop. The workman picks up a length of hose for a different purpose perhaps a dozen times a day. In the engine room the fireman keeps a hose attached to the water connection for the purpose of sprinkling the coal in order to settle the dust. In the machine room the hose is used for carrying water and ofttimes steam.

Hose for conveying steam must be of special construction on account of the constant heat to which it is subjected. The vital

feature of any steam hose is its tube or lining, since the tendency of the rubber is to harden or over-vulcanize under the heat. The average hose is vulcanized at a temperature of about 260 degrees F., and when we consider that steam under a pressure of 100 pounds creates a temperature of about 338 degrees (at 200 pounds the temperature is 388 degrees), the necessity of a special lining can be readily appreciated. Steam hose is constructed with from four to eight plies of fabric in ½ to 2-inch sizes. If the pressure is more than 70 or 80 pounds per square inch the hose should be reinforced with wire or marline wrapping.

FIG. 3. THE WEBB MOLDING MACHINE OPERATED WITH RUBBER HOSE.

Where welding is done by means of the oxy-acetylene or other gas process, the torch is attached by means of a rubber hose to the gas tanks in order that it may be manipulated to the best advantage for heating the metal which is being welded. Here again the flexibility of rubber hose not only widens the scope of the new process of welding, but it also makes possible more convenient methods of accomplishing many other kinds of work which were slowly and clumsily done before the advent of the portable heater. On account of the penetrating ability of gas the lining and layers of rubber between the fabric should be very compact and durable. Such hose is usually made only in small sizes, under one inch in diameter, and with three plies of fabric.

In Fig. 1 is shown one form of a self-contained portable heater in which the attached rubber hose plays an important part. This torch has found a wide use in boiler shop work for shrinking, expanding, heating crown sheets, laying patches, drawing blisters, bending plates, etc. The metal coil which covers the hose is principally for protecting it from wear, since the pressure in this case is not excessive. Certain types of these heaters or torches, when the gas mixture is properly controlled, will give a light equal to more than 1,000-candle power; hence they are often used for night work in places where electric or other lights are not available.

In the foundry rubber hose is as indispensable as in the machine shop, but it is employed chiefly for entirely different purposes. Perhaps the most conspicuous use to which rubber is put in connection with foundry work is in its attachment to the sand blast. Ever since the beginning of the industry foundrymen have been confronted with unusual problems pertaining to the cleaning of special castings; but since the introduction of the sand blast many of these problems have proved easy of solution. One form of the modern sand blast, in which rubber hose forms an essential part is seen in Fig. 2. The tank portion of the apparatus comprises the container for the sand, while the air pressure is introduced through the valve at the side, this valve being connected with the source of the air pressure by means of a length of three or four-ply air hose not seen in the illustration. The hose shown connected with the tank conveys the sand under pressure to the outlet, whence it is directed with great force against the casting. The workmen can move the nozzle about over the work as portions of the casting are cleaned. The apparatus shown herewith will clean from 3 to 5 square feet of steel plate per minute, and as much as ten tons of castings per day, according to the air pressure and the size of the nozzle used.

Sand blast hose must be of special construction in order to withstand the cutting action of the sand. A solid substance, such as hard-vulcanized rubber or a metal lining cannot be used, since these would be worn away very rapidly. Therefore, a thick lining of soft Pará rubber is employed, the lining being almost equal in thickness to the walls of the hose. Such hose rarely comprises more than four plies of fabric, since the erosion resisting qualities are more essential than strength.

Perhaps the hose which is most commonly seen in shops and foundries is fire hose. Where would civilization be today were it not for the introduction of rubber hose in fire fighting apparatus? Of course, hose made of other substances—such as leather—has been tried, but has always proven either too expensive or incapable of standing up under the wear and excessive strain to which they are subjected, Today almost every shop and factory of any size has its private apparatus and a squad of workmen trained to fight fires.

Another instance of the universality of the rubber hose is seen in its application to pneumatic molds and presses, two types of which are illustrated in Figs. 3 and 4. These presses are used for squeezing the molding sand tightly around the pattern so that a good, smooth casting will result. The rubber hose forms an essential part of this device also. It is so arranged that the nozzle or valve at the outlet end may be applied to or removed from the press almost instantly, while the operating lever permits any desired pressure to be brought against the mold. Fig. 4 shows the application of the rubber hose in this respect particularly well. In this machine the hose is designed to withstand an average pressure of about 80 pounds and to deliver about 4 cubic feet of free air per minute. In construction, this hose is the same as that used with other pneumatic tools. The advantages of this machine are many. It relieves the operator of heavy

FIG. 4. TABOR AIR PRESSURE MOLD IN OPERATION.

work and allows him to bend his energy toward greater production. Absolute uniformity in the density of the sand is obtained, by this means, and consequently the loss of castings

due to swelling or blowing of the molds is reduced to a minimum.

All of the machines mentioned above and many others now in use in shops and foundries, were invented after the introduction of the rubber hose and most of them as a direct consequence thereof; for were it not for the flexibility of rubber these tools would not be in existence. In the United States there are approximately 50,000 machine shops and 30,000 foundries, about 80 per cent. of which, according to a prominent machine manufacturer, employ such tools and appliances as those mentioned above. The amount of hose used in these shops for all purposes varies from 100 to 1,000 feet or more, with an average of approximately 300 feet. Therefore it will be seen that with the 64,000 or more establishments using this hose, the amount of rubber going into its manufacture for these few purposes alone is by no means small. An equal amount of hose is, at certain intervals of time, required for replacements, and it is gratifying to the rubber industry to realize that no other substance will meet the requirements and stand up under the abuse to which rubber hose is too often subjected.

MORE RUBBER TILING AND PAVING.

SINCE the question of rubber tiling was dealt with by THE INDIA RUBBER WORLD in the issue of August, pages 583 and 589, other instances besides those recorded at that time have been quoted by the English and Colonial press.

The opinion is freely expressed that with rubber at its present price we may look forward to its more extensive use for offices and for like purposes, as well as for many other uses. In this connection the London Metal Exchange is showing the way by adopting rubber as its principal flooring material, with a view to deaden the noise, and enable operators to follow the bidding with ease. A contract has been placed with the Leyland & Birmingham Rubber Co. for 250 square yards, at a cost of 30*s.* ($7.29) per square yard. The design will be of a special character, the ground harmonizing with the color of the walls.

An interesting experiment was lately made at the junction of the New and Old Kent Roads (one of London's most crowded corners), with the rubber-capped wood blocks invented by M. M. Dessau. As compared with the ordinary concrete foundation of wood pavement the new system is claimed to be an improvement, as the wood blocks are imbedded in an ordinary asphalt grouting, while rubber caps prevent the penetration of moisture into the wood. A few weeks' experience has shown no disturbance under ordinary traffic.

There is apparently no difference in the condition of the rubber tiling of the Silvertown company, laid down eighteen years ago in the large entrance hall of the "White Star Line" offices, Liverpool, while the stone threshold has worn below the tiling and required to be replaced.

"Silvertown" tiling is used in the corridors of the new House of Assembly, at Cape Town, as well as in Buckingham Palace and Marlborough House, London.

A laudable effort to use its domestic product is reported from the Kuala Lumper (F. M. S) Sanitary Board, one of the members expressing the opinion that it was now worth while trying an experiment of paving "Jalan Raja" with rubber, in view of the present price. He agreed to provide a practical test of the strength and durability of plantation rubber under tropical conditions. The Board decided to obtain further information from Singapore rubber manufacturers as to the cost of producing plantation rubber blocks suitable for the purpose intended.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

A FEW MORE FIGURES ON OVERSIZED TIRES.

In our last two issues we published articles setting forth the advantages of oversized solid rubber tire equipment on motor trucks and gave some figures which demonstrated the unwisdom of trying to economize by the adoption of smaller and cheaper tires. As much or more has been done in the collection of similar data for pneumatic tires and we present herewith some figures supplied us by a prominent rubber company.

IT has been shown time and again that overspeeding is one of the worst enemies of the rubber tire, because of the continued distortion to which the rubber is subjected. The rubber compound does not have time to recover from the shock before it hits the road again, and often the distortion is permanent. Equally as important as the question of speed is the proper size of tire for the load it is called upon to carry. It stands to reason that for a given weight of car the larger-sized tire will stand the greater amount of wear. But the percentage increase of the life of the tire far exceeds the increase of cost as well as that of the amount of rubber. In short, oversized tires are proven beyond any doubt to be a great economy.

The figures in the following table are taken from five different pleasure cars before and after equipping the wheels with the larger tires. In each case both the front and the rear wheels were of the same size, and not only was the capacity increased as indicated, but the life of each set of tires was lengthened to more than compensate for the extra cost.

Tire size.	Capacity.	Oversize.	Capacity.
30x3	1400 lbs.	31x3½	1700 lbs.
32x3½	1800 "	33x4	2900 "
34x4	3000 "	35x4½	3700 "
36x4½	3800 "	37x5	4400 "
36x5	4300 "	37x5½	5100 "

Here it is seen that the larger equipment resulted in an increase in the carrying capacity of the car of nearly 25 per cent.

Again, consider the standard car equipments. It is regrettable, but none the less a fact, that some car manufacturers are inclined to place tires of too small size on their cars when they are sent out from the factory. The table below presents data taken from four American-made pleasure cars noted for their poor tire service, the names of the cars in question being designated by letters. The third column gives the capacities with the tire equipment as ordinarily supplied, while the last column indicates the capacity which would be realized by the adoption of oversized tires on the same rims.

Car.	Tire size.	Car weight.	Tire capacity.	Oversize.
A	32x3½	2335 lbs.	1800 lbs.	2900 lbs.
B	36x4	3450 "	3200 "	3900 "
C	36x4½	4100 "	3800 "	4400 "
D	37x5	4675 "	4400 "	5200 "

These figures require no further proof of the advantages gained by the adoption of tires of adequate size.

It should be remembered, however, that an oversized tire does not take care of abuse and overspeeding. With pneumatic tires it is found that a car which averages 20 miles per hour and never exceeds 30, will realize fair service even with undersized tires. Such a car often runs 4000 miles on one set of tires, but by running within the above speed limits on oversized tires the same car should give at least 5000 miles of service. In exceptional cases, a set of oversized tires has been known to give a mileage almost double that of the old equipment.

THE PASSING OF THE STEEL TIRE.

All motor vehicles in Germany must in future be equippel with rubber tires, and France and England are expected to follow with similar legislation. This will greatly increase the demand for rubber tires, as many, especially of the commercial motor vehicles, are still running on wood-block, spring and other tires, which are highly detrimental to road surfaces.

RUBBER TRADE IN BOSTON.

By a Resident Correspondent.

MOST departments of the rubber industry are more or less affected by the general conservatism which prevails in all lines of business. However, there are exceptions, and the most notable one is the clothing business, which seems not only to have escaped the general tendency, but has been and still is enjoying a lively demand which, in more cases than one, has caused the producers some trouble to keep pace with the wants of their customers. The tire business seems excellent for this time of the year, which is in many respects regarded as the quiet season. While some factories are making up stock for spring delivery or in anticipation of the demand that will certainly come early in the year, others claim to have enough to keep their works going some time yet on orders already taken.

The rubber shoe manufacturers would have larger orders were climatic conditions more favorable for retail trade, but the marked increase in the call for tennis lines and the demand for rubber soles help to make business good for the factories which are turning their attention to these lines. Mechanical goods go moderately, and druggists' goods manufacturers are not complaining.

* * *

The Goodyear Tire & Rubber Co. has opened its new store and offices near the Fenway Park baseball grounds. This section is fast being appropriated by automobile warerooms, tire manufacturers' agencies and supply stores. Commonwealth avenue, originally intended exclusively as a residence thoroughfare, now has been almost entirely built up between Beacon street and Brighton avenue with display warerooms for automobiles and motor accessories. The Goodyear company occupies a fine building at 61 Brookline avenue but a short distance from the junction of Beacon street and Commonwealth avenue. Thus another leading house has deserted the Boylston street automobile district, which has been in a turmoil of confusion for months owing to the building of the new subway.

* * *

Boston went football mad on Saturday, the twenty-second of last month, when Harvard and Yale met in the stadium. The Enterprise Rubber Co., equal to the occasion, filled one of its big show windows with a football display which was the talk of the town. The floor of the window was marked off like a regular "gridiron." Two teams of players faced each other, the ball on the central line. The players were red rubber toy dolls about six inches high. One set had crimson ribbons across their breasts, the other similarly designated by blue ribbons. Harvard had a donkey as a mascot; Yale was furnished with a goat and also a dwarf player. With this as a central attraction, the rest of the window was appropriately filled. There were lay figures, lifesize, of a man and woman, at each side, one couple displaying the crimson, the other the blue. There were football shoes, footballs, warm overshoes and windproof coats to complete the advertising effectiveness of the window.

* * *

The Avon Sole Co., which manufactures soles for leather boots and shoes, is now running a night shift, to keep abreast of the demand. Originally started in a small way, under the direction of the inventor, Raymond E. Drake, the day force has now reached 35 hands and the night force 20 hands. The sole, which is known as the "Du-Flex," is made of shredded leather and rubber, well mixed and firmly vulcanized together. This sole, it is claimed, will wear longer than either a leather or a rubber sole, while its composite nature makes it non-slip in effect. It sews well on the shoe machines, finishes well on the edge, and while the present demand for rubber soles continues it must enjoy a good trade. The company makes a sole with double-wear heel and toe, but has given one shoe manufacturing concern in Brockton the exclusive right to this specialty. The company has sufficient orders ahead to keep both shifts at work regularly for some time to come.

* * *

Christmas is coming, and many lines of business which do not naturally gain much by the holiday trade, because of the staple character of their product, are endeavoring to catch some of the flying dollars by giving a holiday touch to their goods. Some four years ago—maybe five—the Apsley Rubber Co. made a dainty little rubber boot, gracefully curved at the top, with pebbled leg, bright finish and a pink fleece lining. Each pair was packed in a substantial pasteboard box, covered with paper embellished with holly leaves and berries. A handsome card, appropriately worded and illuminated, was also enclosed.

About the same time, the Hood Rubber Co., taking advantage of the renaissance (if so it might be called) of the little red-top leather boot for children, got out a red-top rubber boot for Christmas circulation. This was a regular short boot, except that it had a band of red fabric about four inches wide at the top. Like the Apsley boots, these were sent to the trade in Christmas souvenir boxes.

The latest, however, is a combination made for the Duck Brand Co. It is called the "Kid's Combination Set," and consists of a rubber slip-on, a pair of rubber boots, and a hat of waterproof material. All these are packed in a holly-trimmed box, and certainly should be attractive to the active boy or girl who isn't afraid of wet weather. The illustration shows a youngster clothed in the outfit, while a duplicate set is shown with the box in which it comes from the factory.

"KID'S COMBINATION OUTFIT."

* * *

The Rubber Tire Bowling League, which has been so successful in former years, starts out for a busy season. The league has transferred its activities to the Adams Square alleys, contiguous to the automobile district, where eight teams are able to contend at one time. Contests are booked for every Friday night. The league officers are: Fred Dougherty, of the Lee Tire Co., president; A. L. Cherry, secretary; P. L.

Kuhn, of the Empire Tire Co., treasurer. The captains of the various teams are: Empire, A. L. Cherry; G. I. M.-Ajax, L. Furness; Lee, George Reed; Firestone, H. E. Weil; B. B. B., Frank Barrabee; Fisk, Dan MacCarthy; Goodyear, H. J. Herrick; Knight, Everett Prior. Last year's series was won by the Shawmut Tire Co.'s team, but this team is now connected with the Corporation League, and bowls under the name of the Hood Rubber Co.

* * *

In accordance with the usual Thanksgiving practice, the Monatiquot Rubber Works Co. of South Braintree, Massachusetts, presented to its employes gifts of turkeys. This pleasing custom has been followed every year since the company first began business, to the gratification of the employes.

THE RUBBER TRADE IN AKRON.

By a Resident Correspondent.

THE rapid growth in the industries of Akron having brought to that city a largely increased number of workmen, the problem of housing these men and their families has become a somewhat serious one; but with the customary foresight of Mr. F. A. Seiberling, president of the Goodyear Tire & Rubber Co., this situation has been satisfactorily met in the case of this company's employes, a tract of land 400 acres in extent, in the vicinity of the factory, having been purchased by the company, graded, streets laid out, water, sewer and gas pipes installed, etc., and contracts placed for the erection of houses in lots of 100, the intention being to ultimately cover the entire tract, which will accommodate 1,600 homes. This will be known as the Goodyear Home Community, and employes of the company are to be supplied with comfortable residences at actual cost, payments to be on the basis of rent. It is stated that the houses are not all the same style and all have individuality. The opening of the Community, November 1, with the completion of the first 100 houses, was marked by a celebration at which addresses were made by Judge Rogers and a G. A. R. veteran, at the conclusion of which a flag raising was conducted by the Grand Army Post of Akron. It is the intention to convert the land in the immediate vicinity of Blue Pond into a park and playground for the adults and children. The Board of Education has purchased a lot in the neighborhood, and when necessary will erect a school.

A recent announcement of the Goodyear company contains the information that its business during 1913 will amount to $33,000,000, a gain for the year of $7,000,000. This is a very gratifying showing, especially in view of the unfavorable conditions—due to strikes and floods—which for a time last spring prevailed in Akron. The company reports a capacity in automobile tires alone of 10,000 a day, and states that the mechanical goods department added during the past year has already commenced to show profits and promises shortly to be one of the largest in the country. The output of this department during September included 73,750 feet of rubber belt weighing 104,035 pounds; one conveyor belt recently completed, 36 inch, 8-ply rubber, being 1,100 feet long and weighing 13,360 pounds. The amount of garden hose turned out daily is said to be 30,000 feet; and air brake, car heating and corrugated tender hose are also being produced in large quantities.

Further increases are expected in output and general business for 1914, and the company proposes to continue its independence in spite of all rumors which have been circulated to the contrary.

Early in November, while in Akron for the purpose of attending the 71st annual conclave of the grand commandery, the Knights Templars of Ohio to the number of about 1,000 visited the rubber plant of the B. F. Goodrich Co., through the various departments of which they were conducted by guides. One Sir Knight, in recording his impression of this enormous factory, describes it as "the most wonderful sight of my life."

Firestone tires—to which his devotion has been shown on numerous previous occasions—were again used by Barney Oldfield in his winning race of one mile in 48 seconds, on November 6, at Phoenix, Arizona. This lowers the Arizona record by 2 seconds, but falls short of his world's record made at Bakersfield, California, by 1.6 seconds.

Shod with Firestone tires, what is believed to be the largest automobile truck in the world has gone into service in Troy, New York With a wheel base of 17 feet and a body 7 x 9 x 18 feet, it has a capacity of six tons. Firestone hard-base removable tires are used. The truck is the first of several to be installed by the Charles Freihofer Baking Co., of Troy, Albany and Schenectady, and has a capacity of 6,740 loaves.

The restaurant installed in September by the Firestone Tire & Rubber Co. is one of the most popular departures of this company in the interest of its employes, affording them a saving not only in the cost of food, but also in time. Here meals are served at cost—breakfast, dinner, supper and a meal at midnight—good food being provided; and on the opening day 300 men were served in 18 minutes. Previous to installing this restaurant

FIRESTONE RESTAURANT.

the company investigated similar eating rooms maintained by factories in various industrial centers, and the good points of all are said to be combined in this lunch room.

* * *

The stockholders of the Miller Rubber Co. at a recent meeting at the offices of the company, re-elected the old officers for the ensuing year. They are: Jacob Pfeiffer, president; C. T. Grant, vice-president; F. B. Theiss, treasurer; W. F. Pfeiffer, secretary and assistant treasurer. They, together with J. M. Doran, comprise the board of directors. "This has been a record year for the company," said W. F. Pfeiffer, general manager. "Our sales for the fiscal year ending September 30 increased over 61 per cent. over the previous year. When we consider that the entire plant has been changed so as to put all departments in balance, and the factory floor space and equipment doubled, we feel that we should be in position to make a greater increase for the ensuing year without the handicap of having the entire plant torn up."

A civic celebration is planned in honor of the eighty-second birthday of F. H. Holton, one of the oldest rubber men in America. He started in the rubber accessory business in New York in 1846.

Mr. Holton asserts that Akron needs more varied industry. "The rubber industry of Akron depends to a great extent upon the automobile industry. Pleasure automobiles are a luxury and in case of financial or other civic disturbance luxuries are the first to suffer. More and varied industries would help Akron.

"It was a real estate deal which brought rubber to Akron," continued Mr. Holton. "Dr. Goodrich was in the real estate business in New York. In one of his trades back in the '70's he got possession of a little rubber factory which was not making money. After trying to interest New York people in the factory he came to Akron, where he installed his machinery, and started a business under the name of the Akron Rubber Co. I think it was in 1881 when he reorganized, with Col. Perkins and George W. Crouse as the principal backers. It was then that the company took the name B. F. Goodrich Co.

"At that time I had a little rubber accessory shop in New York. In 1885 Dr. Goodrich brought me out here and placed me in charge of the accessory department. I remained with the company until 1900. When I came here, we didn't do as much business in a year as the Goodrich now does in one day. The industry braced up after bicycles became popular in the '90's and other companies started. Then came the automobile and with it more and more uses for rubber."

* * *

Rubber common stocks which have for some time been inactive, displayed some life during the past few days. Late quotations are as follows:

	Bid.	Asked.
Firestone preferred	102	103¼
Goodyear preferred	96½	97
Miller	...	125
Swinehart	78½	80¼
Goodrich common	18½	19½
Goodrich preferred	81	82

* * *

Ralph Upson and R. A. D. Preston, the Akron boys who gained world-wide fame by winning the International Balloon Race out of Paris, October 14, arrived in Akron on the 22nd in time for the big home-coming celebration planned in their honor on the afternoon of that day. In order to reach here on time they were obliged to cable the Aero Club of America headquarters in New York to cancel the dinner and reception arranged in their honor on the night of the 21st. The monster balloon "Goodyear" in which they won the sensational air race arrived in Akron on the 18th. The reception in their honor was held at the Court House. There was a patriotic program, with band music, speeches and singing. One of the features was the presentation of loving cups to the young aeronauts.

CANADIAN COMMERCE IN RUBBER GOODS.

The following table shows statistics of rubber exports and imports of Canada for the first six months of the years 1912 and 1913:

	1912.	1913.
IMPORTS.		
India rubber, gutta percha, and manufactures of	$5,157,256	$6,117,846
Elastic, round or flat, including garter elastic	93,147	75,042
EXPORTS.		
India rubber, gutta percha, and manufactures of	223,593	474,084

"What does this nation need?" shouted the impassioned orator. "What does this nation require, if she steps proudly across the Pacific, if she strides boldly across the mighty ocean in her march of trade and freedom? I repeat, what does she need?"

"Rubber boots," suggested the grossly materialistic person in a rear seat.—*Kansas City Star.*

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE RUBBER TRADE IN CHICAGO.

By a Resident Correspondent.

BUSINESS has not as yet started upon its winter activity, hence not much change is noted since last report. Altho Thanksgiving is past and gone, Chicago, much to the discouragement of the rubber industry generally, and especially of the boot and shoe trade, is enjoying an Indian summer.

In the mechanical rubber line the slackness has not been so marked as in some of the others. The demand for rubber belting has been considerably better than at this time last year, which is attributed to the large number of grain elevators now being erected in the West and in Canada. In Iowa, Nebraska and Kansas the farmers' co-operative elevator movement is growing every day, and while most of the elevators being erected are of small capacity, in the aggregate the amount of rubber belting required is enormous. The large crops which have been garnered during the past few years in these States also necessitate increased facilities for handling the surplus, and consequently a large number of new elevators, some of them big ones, have been built by private and line companies. The headquarters of many of these latter are located in Chicago, and for that reason these companies are inclined to buy fixtures for the new elevators here in the city, a tendency which local rubber belting houses are constantly doing the most in their power to stimulate by the personal solicitation of salesmen.

On the other hand, the rubber belting business has received a decided blow from two quarters. One of these is in the northern Michigan copper region, which has during the past few weeks been the scene of a number of desperate strikes, featured by pitched battles between miners and militia. The mine owners have been more stubborn than usual in coming to an agreement with the men, claiming that the conditions under which they were working in the mines were better than usually prevail in such places. The peace which has been arranged is more in the nature of a truce than anything else, and those who have made a study of the situation—including a number of Chicago rubber belting manufacturers—declare that hostilities are certain to break out again after the first of the year. Of course during all this trouble the mine operators have not been placing orders for rubber belting, packing or any of the other lines handled by mechanical rubber dealers, of which they formerly ordered to the extent of many thousands of dollars at this time of year. The loss from this source is a matter of great concern to dealers here, and they are hoping for an immediate and permanent adjustment of the trouble. The other quarter from which the rubber belting business has received a blow is northern Mexico, where unsettled conditions have played havoc with the great copper mines. With federals and insurrectos trying to make sieves of the hillsides and of each other, and tearing up railroad tracks whenever they can muster enough energy, these mines have been compelled to curtail operation, or shut down altogether, which latter course has been followed in many instances. These concerns, which are in most cases owned by Northern capital, formerly sent in large orders at this time of the year, but now little or no business is being received from them. The only considerable order received from this region during the past month was by the Gutta Percha & Rubber Co., 301 West Randolph street, from the Cananea Consolidated Copper Co., Cananea, Mexico, for rubber belting aggregating several thousand feet.

The druggists' sundry business is fairly good at the present time.

Two facts have conspired to make the tire business dull—mainly the season, and an expected change in price.

* * *

Rubber overshoes and boots have been very active in the local market during the past month, all dealers in these lines reporting a most satisfactory demand. Raincoats are also experiencing the usual seasonable demand and are being offered at such low prices in the windows along South State and in Van Buren streets

that passers-by are tempted to purchase whether they are in immediate need or not. On rainy days rain coats are well advertised in the newspapers, and some of the more enterprising merchants have even gone to the extent of getting out attractive dodgers which they hire small boys to distribute to the "loop" crowds during the noon hour. One dealer recently startled the public and sold out his stock on short notice by installing a shower bath in his window and stationing beneath it his pretty daughter, clad in nothing but one of his latest model raincoats. The police were at last compelled to stop the spectacle, owing to the crowd, which blockaded the street, but not until the dealer had disposed of a stock which had been a white elephant on his hands for several months.

Thus it will be seen that there are still a few new things under the sun, which thought should give pessimistic rubber men who are trying to figure out new ways of stimulating business increased courage and steadfastness of purpose.

* * *

The tire men ought to be interested in the better road system which is in store for outlying Chicago districts. Thirteen States, according to the compilation of Dr. E. S. Whitlin, assistant in social legislation in Columbia University and chairman of the executive committee of the National Committee on Prison Labor, have passed laws during the present year allowing the use of convicts in the construction and repair of highways. Illinois is one of the thirteen States. In addition, the Cook county board contemplate the voting of a good round sum to road improvement.

* * *

Tire men are well represented among the list of new members taken into the Chicago Automobile Club during its recent successful membership campaign. The object of the club has been to product greater activity in the automobile trade. During the last two years it has successfully promoted the Elgin road races and the interclub reliability tours, and preparations are being made for even a greater scope of activity for next summer.

* * *

Several of the dealers interviewed said that they thought business would improve as soon as some definite legislation was made in the matter of currency reform. Under the present system of procrastination in this regard, with the bankers of the West playing safe until they see what is going to happen, money has become tight at a time when it ought to be easy. This does not affect the rubber dealers themselves directly, but the great concerns which they sell are in a way to become embarrassed by this condition. and for that reason are inclined to purchase at this time only what they are compelled to have. There seems to be a lack of confidence in the administration. The new tariff has had but little effect on the local market, as imported goods cut but a small figure here.

A. Romain, of the Quaker City Rubber Co., announced that his concern had been experiencing a satisfactory trade, with the single exception of automobile tires.

The Gutta Percha & Rubber Co. said that business for the past few weeks had been better than usual at this time of the year. The biggest order of the month which went out from the Chicago branch was shipped to the Girard Point Elevator of the Pennsylvania Railroad, located at Philadelphia. This order consisted of rubber belting, and totaled more than 9,000 feet, which included a single belt 1400 feet in length.

John Mills, manager of The New York Belting & Packing Co., declared that he did not think there was as much mill building this fall as last year, but said that prospects for the spring in this line were shaping up in a most satisfactory manner. He reported that the demand for most of the mechanical rubber lines was good; better, in fact, than for several weeks past.

F. B. Henderson, of the Mechanical Rubber Co., stopped dictating a letter long enough to announce that he had been in the game twenty-five years, and had come to believe that the periods of dullness in the rubber business were never of long duration.

"For that reason," he said, "I predict that the present slack period will soon end, possibly before and certainly after the first of the year. In the rubber business it has been my experience that there are never any periods of hilarious prosperity or disastrous slackness. The trade has a pretty even tone, with few fluctuations one way or the other. Of course, certain lines may experience sudden heavy demand or sudden dearth, but I speak of the rubber business in the aggregate."

According to Mr. George G. Bryant, general manager of the Chicago Rubber Clothing Co., the season is proving extraordinarily good.

The Reinsburg Auto Tire & Supply Co., dealers for years in new and used tires, has opened up a new line. This is now the only company in the United States, outside of the factories, that repairs solid tires for electrics. Previously, all tires had to go back to the factory for repair. Heretofore there has always been a certain reluctance about establishing this as an independent business. A full line of new machinery is demanded, and it was felt that factory competition would be too strong. On the contrary. Mr. Reinsburg reports many orders from the branches of large tire manufactories, which find it a more profitable and time-saving process to have their repairing done in Chicago.

For twelve years the W. F. Salisbury Co. has represented the Electric Hose & Rubber Co. of Bloomington, Delaware; but recently a radical change has been made. The Salisbury Co. is now manufacturing a new line of hose of its own brand, an undertaking which is proving a great success.

Mr. J. E. Duffy, manager of the Thermoid Rubber Co., has just returned from a business trip to Denver.

Mr. R. B. Tracy, Western manager for the Michelin Tire Co., is now on a business trip in Minneapolis in the interests of the firm.

The Empire Rubber & Tire Co., 1305 South Michigan avenue, will occupy its new addition at 1627 South Michigan avenue, about the middle of November.

The Auto Tire Brokerage Co. reports a rushing mail order business. The first of December, the manager, Mr. F. W. Potts, will leave for a two months' pleasure trip in California.

THE RUBBER TRADE IN RHODE ISLAND.

By a Resident Correspondent.

THE rubber factories throughout this State continue to be operated at capacity, and at several of the plants new buildings or additions have recently been constructed. From all sections it is reported that present shipments are greatly in excess of all previous movements. Generally speaking, there has been no diminution in the number and size of orders received, and to meet the demand several of the plants have recently started additional machinery on the night shifts.

* * *

Factories that produce boots, shoes and other footwear are still enjoying the busiest season that they have experienced for several years, according to the reports, and there is apparently no prospect of immediate slacking. Factories that are making tires and other rubber fittings and accessories for automobiles are likewise running to their fullest capacity with accumulating orders ahead.

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The close association between the affairs of the Walpole Tire & Rubber Co., Consumers' Rubber Co., and the suspended Atlantic National Bank of this city is responsible for the keen interest that is manifested in business circles here in anything that pertains to either of the three. The proceedings of the Federal Grand Jury in indicting the former president of the

bank and three promoters of New York and Mexico were closely watched, as it was rumored that other officials of the bank were also to be indicted. The suspension of a Lowell bank in which Alva Baldwin, of the Walpole Rubber Co., also a director of the Atlantic bank, was largely interested, made another connecting link in the chain of affairs. The report of the Walpole company's receivers will be found elsewhere in this number.

* * *

Colonel Samuel P. Colt, president of the United States Rubber Co., is to spend the winter in New York, and has closed his Bristol residence, "Linden Place," this month. It is stated that Colonel Colt intends making a visit next spring to Java and Sumatra, for the purpose of looking over large rubber interests recently acquired. In a letter received a few days ago by Lewis Herreshoff, of Bristol, from his cousin, Thomas Prentiss, of Batavia, the latter writes: "If Brazil doesn't take a brace, Java and Sumatra will soon be passing her in the amount of raw gum exported for use in the rubber industry.

"Colonel Colt's rubber proposition in Sumatra is by all accounts a wonderful one," writes Mr. Prentiss. "He has been very fortunate in picking out winners to work for him, and therein lies the success of the whole undertaking."

* * *

The business at the Davol Rubber Co., Point street, this city, is rapidly expanding, and the concern has recently been calling for a large number of girls over 16 years of age for steady employment in the several departments.

* * *

Extensive improvements have been going on at the plant of the National India Rubber Co., on Wood street, Bristol, for several months, and some big changes have been made there. It is understood that others are under contemplation, including the pulling down of the old carpenter shop, a wooden structure, as well as all other wooden buildings on the property, and replacing them with stone buildings. The management is also considering the erection of another extensive addition to the wire plant. This branch of the business has grown to great proportions during the last few years, and the present indications are that the capacity will be doubled in a short time. It is planned to change the time of taking the annual inventory at this factory from the spring to the last week of the year.

* * *

The Woonsocket Rubber Co. has just received permission from the authorities of that city to erect an addition to its mills there. Work will begin at once. The new addition to the plant of the Alice Rubber Mill at Woonsocket is practically complete, and the placing of the machinery has already commenced. Business is reported as having been unusually good during the entire year, and the new addition has been badly needed for some time to keep pace with the orders.

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The recent shipments of the International Rubber Co. of West Barrington are said to have been the largest in the history of the concern. The departments are being operated on full time and there is every promise of a continuance of rush work during the winter.

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The petition of Charles H. Graves, president of the Invincible Tire Co., at 53 Sabin street, this city, for the appointment of a receiver of that concern was heard before Presiding Justice Tanner in the Superior Court for Providence county recently, and Arthur A. Thomas, an attorney, was appointed as permanent receiver of the corporation, with a bond of $5,000.

THE RUBBER TRADE IN SAN FRANCISCO.

By a Resident Correspondent.

DURING the past two weeks there has been an unusual fall of rain, sufficient to make up for the previous shortage, and more than ample to surpass the total rainfall up to the same time last year. This condition has started the rubber clothing lines so that they are now exceptionally active, a condition most pleasing to the heads of these departments.

The big building on the corner of Fremont and Mission streets, formerly occupied by the Studebaker Co., is now being equipped to accommodate the Western offices of the B. F. Goodrich Co. and the Diamond Rubber Co. The present quarters of the B. F. Goodrich Co. at No. 345 Market street, are to be leased. There will be some reduction in the size of the force of employes, but in the main it is intended to continue the business of both establishments along the old lines, each firm looking after its own customers.

* * *

The Roblito Rubber Plantation Co. has been incorporated with its principal place of business in San Francisco, with a capital stock of $600,000. The incorporators are G. Scalmanini, L. A. Carter, E. L. Fischer, J. Cassarelto, and O. M. Goldaracena.

* * *

The Panama-Pacific International Exposition Co. has placed an order with the American Rubber Manufacturing Co. for 10,000 ft. of cotton rubber fire hose.

* * *

The Hendrie Rubber Co. is now successfully operating its automobile tire factory at Torrence, California, and the owners are satisfied that they can compete with Eastern tires. This company has established a branch in San Francisco, placing Mr. E. Milburn in charge as sales manager. Mr. Milburn states that already his factory is able to manufacture forty-four tires per day, and by the first of the year they expect to be turning out at least a hundred a day. Not only is the tire a California product, but also all the cotton used in the fabric, this being grown in the now famous cotton-growing belt of the Imperial Valley, and worked into shape for use in tires in California cotton mills. Mr. Milburn is satisfied with the showing so far made by his selling force. This State is second only to New York in the use of automobiles, and there is a great demand for tires, and as his factory is able to produce a tire which compares favorably with Eastern lines there is no reason why he should not do well in open competition.

* * *

The breaking of ground for the factory of the Panama Rubber Co. at Compton, California, was marked by quite a celebration, the day having been declared a holiday, and the ceremony, witnessed by 3,000 persons, being presided over by the mayor and Mr. W. D. Newerf, president of the company. The factory building will cost about $125,000, and the industry will no doubt be a valuable aid to the community.

Arthur W. Savage, president of the Savage Tire Co., also the maker of the Savage firearms, was a recent visitor in this city. His tire factory is a comparatively new venture, and is located at San Diego. The tire is distributed in this territory by Baker & Hamilton.

The Playa Vicente Rubber Co. has been incorporated at Tucson, Arizona, with $500,000 capital stock. The incorporators are: J. A. Pritchard, W. V. Olschewski, M. Christman, H. L. Rotchschild and I. M. Golden, all of San Francisco.

The Pasadena Rubber Co. has been incorporated at Pasadena, California, by A. R. Riley, F. B. and Nellie L. Cole, with a capital stock of $10,000.

The B. F. Wade Tire & Rubber Co. has been incorporated at Los Angeles.

A tire factory is soon to be established at Port Mann, British

Columbia, by a company headed by F. M. Gates of Portland, Oregon, in a building to be erected for that purpose.

The Keaton Vulcanizing Works have recently secured a court decree changing their name to the Keaton Tire & Rubber Co.

W. H. Bell, manager of the San Francisco branch of the Firestone Tire & Rubber Co., has returned from his visit to the annual sales convention held at Akron.

O. M. Clark, of Seattle, has been appointed chief clerk of the Spokane branch of the Goodyear Tire & Rubber Co., a vacancy created by the promotion of Decatur Lea to the position of adjuster and counter salesman.

C. A. Muller has been appointed distributor and adjuster for the United States Tire Co. of California, newly organized to take over the Gorham-Revere Rubber Co. and the Pacific Coast interests of the United States Tire Co. Mr. Muller will represent the firm in Alameda and Contra Costa counties through his stores at Oakland and Berkeley.

A. T. Smith, formerly connected with the Chicago branch of the Firestone Tire & Rubber Co., where his work has been highly commended, has been appointed manager of the Los Angeles branch of that company, to succeed R. D. Barr, killed in an automobile accident in July.

N. S. Dodge, of the American Rubber Manufacturing Co., has moved his offices from the factory at Emeryville to Mission street, San Francisco, where the main offices and salesrooms are located.

F. M. Steers, of the Pacific Mill & Mine Supply Co., is now on a Northern trip on business for the company.

George Hand, formerly employed with the Gorham Revere Rubber Co., has accepted a position with the Diamond Rubber Co.

THE UNITED STATES RUBBER CO.'S NEW STOCK ISSUE.

ON November 6 a circular was sent out by the United States Rubber Co. to its stockholders announcing a new issue of first preferred, 8 per cent. stock, to the amount of $9,422,000, which represents an increase of 10 per cent. over the present outstanding stock, each stockholder being offered the privilege of subscribing for one share of the new stock for every ten of either preferred or common now held. The letter is given below:

UNITED STATES RUBBER CO.

1790 BROADWAY,

NEW YORK, November 19, 1913.

TO THE STOCKHOLDERS OF THE UNITED STATES RUBBER CO.:

Recent outlays in enlargements of plants and on the company's plantations in Sumatra and in connection with the expansion of the company's business and the desirability of providing therefor without increase of funded debt, have led your directors to offer to our stockholders for subscription at par $9,422,000 of our 8 per cent. first preferred stock, this being equivalent to ten per cent. of the present outstanding capital stock, thus giving to each stockholder the privilege of subscribing at par for one share of first preferred stock for every ten shares of stock whether preferred or common held by him.

Under this plan the stockholders will receive the full benefit of the issue without payment or allowance of any commission or other like expense.

For the fiscal year to October 1, 1913, the business of the company both in volume and profits, has been fully equal to the business for the corresponding period of 1912—the business of which year both in volume and profits exceeded that of any year in the history of the company—which fact your directors regard as most gratifying and promising.

It is confidently expected that before long our extensive plantations in Sumatra will provide the company with sufficient crude rubber to meet a substantial part of its requirements at actual cost of production, and that its rapidly expanding development department will lead to important economies in the utilization of the crude material and in manufacturing methods. Moreover, with the outlays being made, the company's plants will be in condition to take care of the increased business which it is believed lower prices for crude rubber will stimulate. To meet these developments through the co-operation of our stockholders by an increase in capital stock seems to your directors a wise and conservative move at this time.

Subscription rights will apply to stockholders of record at the close of business on Friday, November 14, 1913, and, as soon as may be after that date, warrants will be mailed to all stockholders, viz.: Assignable subscription warrants to all holders of ten shares or of any multiple thereof and warrants for fractional rights of subscription, expressed in tenths, to holders of less than ten shares or of shares in excess of ten shares but aggregating less than ten shares in excess of a multiple of ten shares, such fractional warrants in appropriate amounts to be exchangeable for subscription warrants on or before December 15, 1913.

All subscriptions will be payable at par, in cash or New York funds, on or before December 15, 1913, and certificates of stock will be issued as soon thereafter as practicable.

SAMUEL P. COLT, President.

On November 19 the warrants were mailed to the stockholders of record of November 14, together with a second circular letter from the president, which was as follows:

UNITED STATES RUBBER CO.

1790 BROADWAY,

NEW YORK. November 19, 1913.

TO THE STOCKHOLDERS OF THE UNITED STATES RUBBER CO.:

In sending to our stockholders warrants in accordance with our circular letter of November 6—in view of inquiries received from stockholders and in order to avoid misunderstanding—your president thinks it well to state that in his opinion the present offering of $9,422,000 first preferred stock to our stockholders at par should have no injurious effect upon future dividends upon either the preferred or common stock of the company, and for the following reasons:

FIRST—If all stockholders avail of their privilege to take their ratable shares of the new stock at par, the company will receive and will have the future benefit of the full proceeds therefrom, without diminution for commissions or otherwise, namely $9,422,000. The 8 per cent. dividend upon this sum amounts to $753,760 a year, while the same sum if borrowed at 6 per cent. would cost the company $565,320, a difference of $188,440, which difference is paid pro rata to the stockholders subscribing. As last year, before paying interest and dividends, the net earnings of the company were $9,509,193.30, it is manifest that this increase of $188,440 is relatively immaterial in its bearing upon dividends.

SECOND—Furthermore, in the opinion of your president, the purposes for which this money will be used will result in increasing the revenue of the company far beyond the 8 per cent. dividend thereon.

Should the privilege offered our stockholders of subscribing not be availed of by all. the stock remaining, having once been so offered, may by the directors be otherwise disposed of at the same or a higher price than that at which it is now offered to stockholders.

SAMUEL P. COLT, President.

KEEPING TABS ON TIRES.

Corporations using a large number of trucks equipped with rubber tires have found it much to their advantage to keep an accurate record of the service secured from the tires. The New York Edison Co., which uses a great many service trucks, employs a system which enables it to tell with extreme accuracy just how every tire purchased by the company performs. It has a double card system, one card devoted to each individual tire and the other card devoted to each vehicle. In addition to this, there is a daily report that summarizes the whole tire service. The card devoted to the tire gives the tire number (each tire when purchased is numbered by the company, the number appearing on a metal plate fastened to the spoke of the wheel, where it cannot be effaced by wear), records the maker's name, the type of vehicle on which it is used, the maker's serial number, the date purchased, the date on which its use begins, the position on the vehicle, date when removed, cause of removal, the mileage, and number of days in service—besides general remarks.

OBITUARY RECORD.

EBEN BLAKE PAGE.

EBEN BLAKE PAGE, treasurer of the Hub Gore Makers, died in Winchester, Massachusetts, on October 28, in his seventy-seventh year. Mr. Page had been prominent in Boston business circles for over half a century. Besides being connected with the Hub Gore Makers, he was for a quarter of a century one of the directors of The Rubber Manufacturers' Mutual Insurance Co., whose officers, at the time of his death, paid a tribute to his memory in an appreciation and resolutions signed by the president and secretary, which are given below:

"Mr. Page, at the time of his death, was in his twenty-fifth year of service as a member of the board of directors of the Rubber Manufacturers' Mutual Insurance Co. The last two years of this time he was its vice-president and a member of the Finance Committee. He was also a director in the Cotton and Woolen and the Industrial Mutual Insurance Companies. His record of service with these allied companies is an honorable and helpful record.

"Mr. Page came to Boston from Connecticut in his early manhood and his business life since has been here. At the time of his coming Boston was a comparatively small city. Since then the city's growth, the increase in capital and the improved methods in business make a wonderful story. But with him it was not a story, but an experience. He was in it and a part of it, and words but feebly tell of the moving—pressing—alert activities of a busy life in this city in the last sixty years. Mr. Page showed to the world a cheerful and genial side, but he took his responsibilities seriously. He held his honor sacred.

"He was Episcopalian in his religious associations, a personal friend of the late Bishop Phillips Brooks, and his eldest son, Rev. Herman K. Page, D. D., is rector of St. Paul's Episcopal Church in Chicago. His only other son, John E. Page, has been his reliable aid in his business here. Both are able and worthy sons of an honorable father and a Christian home.

"RESOLVED: That this estimate of the life and character of Eben Blake Page, for many years a director and officer of the Rubber Manufacturers' Mutual Insurance Company, be written in the records of this company as a tribute to his memory, and that a copy of the same be sent to his family with expressions of our sympathy for them in their bereavement."

COUNTESS DE ALMEIDA.

All of these who were connected with the Fourth International Rubber Exposition, held in New York, will be shocked to learn of the death of Countess Candido Mendes de Almeida, the wife of Count Almeida, who was president of the Brazilian Commission and had charge of their wonderful rubber exhibit. The Count and the Countess not only met most of the important visitors at the exposition, but visited rubber centers throughout America and made a host of friends.

DR. CHARLES McBURNEY.

Dr. Charles McBurney, the famous New York surgeon who died November 7, at the home of his sister in Brookline, Massachusetts, was a son of Charles McBurney, one of the founders of the Boston Belting Co. Dr. McBurney graduated from Harvard in 1866, and from the College of Physicians and Surgeons in 1870, and immediately thereafter took a leading place among the surgeons of the United States. He held many positions in connection with the larger New York hospitals, and was a member of many medical associations on both sides of the Atlantic.

The November number of "R-u-b-b-e-r" published by the Beacon Falls Rubber Shoe Co., of Beacon Falls, Connecticut, has a very appropriate cover showing a large and corpulent turkey with a background of tall trees and crimson sky. The number contains the usual interesting matter on various phases of rubber shoe selling, and is illustrated by reproductions of some of the most popular Beacon Falls shoes. It is a small publication in size and goes easily into one's pocket, so that the retailer who gets it is very likely to carry it home with him, and peruse it after the lamp and his pipe are lighted.

THE DETECTORPHONE FOR LOCATING MACHINE TROUBLES.

ONE of the greatest expenses in connection with the repairing of machinery, where the exact trouble is not known, is the location of the defect. This is particularly so in locating leaks in a pipe line or determining what part of a machine is loose when a knock occurs. Science has produced an electrical device called the "Detectorphone," by means of which a leak or mechanical trouble may be located within a few minutes. A more descriptive name for this instrument would be the "Mechanical Stetnoscope."

The illustration shows an inspector using the instrument in the Boston plant of the Edison Electric Illuminating Co. When a knock makes itself evident in a machine and the exact location

HUNTING MECHANICAL TROUBLE WITH THE DETECTORPHONE.

of the trouble is not known, the operator places the point of the instrument on different parts of the machine frame, cylinder, or other part where the trouble is likely to be found. At the point where the instrument indicates the loudest noise, the operator may be sure that he has located the trouble. The vibration of the machine is transmitted to the receiver, and there made audible by a slight buzzing sound. Any irregularity which may be inaudible to the unaided ear can thus be instantly detected in the receiver. The device consists of a sensitive microphone and a six-inch dry cell inclosed in a metal cylinder, a telephone receiver and two metal rods. One of these rods is screwed into the front of the instrument until it engages the diaphragm of the microphone. In this instrument rubber plays the part common to telephone and similar apparatus. [Boston Talking Machine Co., 41 West Street, Boston.]

Ordinarily the running board of an automobile is finished with a brass edge. This adds to its appearance and also serves as a protection to the wood. But of course the brass edge is rather slippery, a condition which has its disadvantages at times. So a London company has brought out a foot-board with a brass edge having a groove in which a tubular strip of rubber is inserted—just enough rubber to keep the foot from slipping.

William Appleton Lawrence.

THE guayule shrub had been known to contain rubber almost from the time of Goodyear. It was not, however, until a New York chemist-engineer-inventor, William A. Lawrence, took hold of the extraction problem in earnest that it was solved. His success is briefly outlined in the following sketch:

Mr. Lawrence, a manufacturing chemist for more than forty years, had been located for twenty-five years at Waterville, New York. He was a member of the firm of Whiting & Lawrence, who extracted hops, using gasolene as the solvent In connection with this work, he invented a process for the refining of gasolene into rhigoline and had the process patented. This process came to the notice of the Standard Oil Co., as the firm of Whiting & Lawrence was then the largest consumers of gasolene in the country. They therefore sent their head chemist, Dr. Saybolt, to Waterville, where he remained with Mr. Lawrence for two weeks to examine the rhigoline process. Very naturally, then, when the promoters of a proposition to extract rubber from guayule shrub went to Dr. Saybolt in search of a chemist who could give them the clearest report on the process proposed, he advised them to consult Mr. Lawrence, particularly as this was a gasolene process.

WILLIAM APPLETON LAWRENCE

At this time Mr. E. B. Aldrich had been entrusted with the whole management of the affairs of this proposed extraction of rubber from guayule. Mr. Aldrich called Mr. Lawrence to New York and induced him to enter upon a series of experiments of extraction by gasolene which would give a reliable idea as to the value of the process. At the end of six months of constant labor on this process, Mr. Lawrence reported positively against the use of gasolene. He at the same time, however, reported some merit in another process (alkaline), called to his attention by Mr. Aldrich, and it was while experimenting on this that Mr. Lawrence discovered the process which is now almost exclusively used; namely, the process of "rubbing and pressure in the presence of water." This process was patented and assigned to the Continental Rubber Co. of New York, organized to use the process, and Mr. E. B. Aldrich was made president and Mr. W. A. Lawrence vice-president, the latter retiring from his hop extract business to become actively interested in the extraction of rubber from guayule.

It is interesting to note that the first work done by Mr. Lawrence on guayule rubber was as early as July, 1901, and from then until July 8, 1902, continual work and experimenting was going on. About that time he found that after grinding up the shrub in water, a fiber of rubber was formed, and this fact convinced him that there was no need of a chemical process, that the rubber could be extracted simply by rubbing in the presence of water. Mr. Lawrence, in a temporary laboratory at his home in Jamaica, Long Island, and with the assistance of his daughter—herself a chemist—made a small pebble mill out of a glass fruit jar, using pebbles from the street and grinding the shrub in a small coffee mill. They thus secured some small particles of rubber. They also found that rubbing (reciprocal) the ground shrub between two rough surfaces produced the same result. The inventor immediately patented this process and afterward assigned it to the Continental Rubber Co.

During the early part of 1903 Mr. Lawrence, together with Mr. Aldrich, spent months in Mexico, exploring the country to make sure of the shrub supply. When they found sufficient to make the proposition a commercial enterprise, a small manufactory was established in New York, where a regulation-sized pebble mill could be operated. This worked successfully, and in August, 1903, The Continental Rubber Co. was organized. The desire of the company now was to produce enough extracted guayule rubber to try it out commercially. In February, 1904, the late Captain F. H. Hunicke was engaged, and, after doing some work in New York in preparation, went to Mexico with Mr. Lawrence and Mr. Aldrich to look the ground over for a factory. It was not until 1905, however, that a small factory was established in Torreon. Here was produced enough rubber to have the quality thoroughly tried out by rubber manufacturers. This proof that guayule rubber was of commercial value greatly encouraged the Continental Rubber Co., and at once Captain Hunicke's ability was displayed in the erection of a monster plant at Torreon.

In making guayule a merchantable article, Mr. Lawrence gives credit to a number of people—to Mr. Aldrich for the pioneer work and the financing of the project; to Captain Hunicke, who did yeoman's service in Mexico in the early work of production and the erection of a factory with a capacity of over a million pounds of rubber a month; to D. A. Cutler, the first chemist to give guayule rubber credit for its real commercial value; to the Manhattan Rubber Manufacturing Co., the first rubber company to recognize its value in the connection with the manufacture of mechanical goods. With all of his modesty, however, he is bound to admit that the mechanical process that successfully separated the rubber from the fiber was his own invention. The success of the first Lawrence patent stimulated invention so much that in Mexico alone hundreds of processes and machines were registered. Among the inventors were a half score of Mexicans, among them being Enrique and Salvador Madero. Of Americans there were: E. B. Aldrich, F. H. Hunicke, A. H. Marks, F. C. Hood, R. A. Leigh, Ferdinand Ephraim, and others. Europe also added its quota in the patents granted to Adolphe Marx, E. Delafond, Guillermo Prampolini, Fernand Tivier, and others. Of the dozen factories projected under various processes, none was as important as the Continental, nor any method of extraction equal in simplicity and efficiency to the Lawrence process.

Besides the pebble mill process cited above, Mr. Lawrence patented a dozen or more machines and processes both for extraction and deresination. Today at eighty he is still active, still interested in rubber, and still at work experimenting and inventing.

PERSONAL MENTION.

At a meeting of the board of directors of the United States Rubber Co., held November 6, Mr. Nicholas F. Brady was elected a member of the executive committee, to fill the vacancy caused by the death of his father, the late Anthony N. Brady.

Mr. J. Simao da Costa, of Rio de Janeiro, and one of the best-known rubber men in all South America, has been elected a member of the board of directors of the Goodyear Tire & Rubber Co. of South America.

Mr. Algot Lange, explorer along the upper tributaries of the Amazon, author of the book, "In the Amazon Jungle," and lecturer on South American topics at the International Rubber Show held in New York last fall, has been engaged to deliver a series of lectures on Brazil at the International Rubber Show to be held in London next June.

Mr. John Hopewell, one of the proprietors of the Reading Rubber Mills of Reading, Massachusetts, gave his neighbors and fellow club members an unusual entertainment on November 1, when he invited them to an old-fashioned New England dinner, held in the new barn just finished on his estate in Newton. The table, decorated with vegetables and autumn leaves, was set between two long rows of cow stalls. The toastmaster regulated the events of the evening with a particularly large cow bell, and the speeches, given by some of the best-known wits around Boston, had to do with such farm subjects as "Melons, and How to Cut Them."

E. F. Thompson, formerly a department manager for the Motz Tire & Rubber Co. at Akron, has been promoted to the position of sales manager.

Dr. Saylor, former vice-president of the Goodyear Tire & Rubber Co., Limited, of Canada, has been given charge of the business of this concern in Great Britain and on the Continent, and headquarters for the handling of this extensive trade are to be established by him in London.

H. B. Beattie has established at 719 North Broad street, Philadelphia, a firm known as H. B. Beattie & Co., for the sale of automobile tires of all kinds and of accessories. Previous to engaging in this enterprise Mr. Beattie was connected with the L. S. Hall Rubber Co., also of Philadelphia.

R. P. Dowse, lately representing the Goodyear Tire & Rubber Co. from headquarters at Akron, and previously with the Detroit branch of that company, has been transferred to the territory east of Buffalo.

Herbert L. Severance, well known in both tire and automobile selling fields, has been appointed sales manager of the Racine Rubber Co. of Racine, Wisconsin.

John V. Harding, for some time past in charge of the Detroit branch of the Motz Tire & Rubber Co., is to extend his field of operations in the interest of this company to cover the whole of the United States.

Mr. C. B. McKay, who for many years has been in Manáos, connected with the rubber importing house of Adelbert H. Alden, Limited, has accepted a position with an important American rubber manufacturing company. His plan is to leave Manáos shortly and spend the winter visiting the islands of the Caribbean and some of the countries on the mainland, such as Costa Rica, arriving in New York in the spring.

E. L. Dale, formerly employed as a salesman by the Mishawaka Woolen Mfg. Co., manufacturers of rubber footwear, has gone into the automobile business at Anna, Illinois.

The Brazilian congress at Rio de Janeiro has voted a special appropriation of 1,500 contos of reis—equal to $813,000 gold—to be used at the San Diego and San Francisco expositions in 1915, the two expositions to share equally. This means that the Brazilian Tropical Products Exhibition, with its great rubber adjunct and its out-of-door *Hevea* plantation, with $400,000 to expend upon it, will be a very notable and unique exposition.

Mr. Warren Trumbull, president of the Gutta Percha and Rubber, Limited, Toronto, Canada, was a recent visitor to New York.

MR. STEARNS WITH THE CONVERSE COMPANY.

Mr. Edgar G. Stearns, who for nearly twenty years represented the United States Rubber Co. in Chicago and the middle west, leaving that company two years ago to become associated with the Banner Rubber Co. of St. Louis, has recently taken the management of the Chicago agency of the Converse Rubber Co. at 323 Jackson Boulevard, west.

MR. ARMSTRONG GOES TO BOSTON.

The Loewenthal Co., of New York, announce that in order to keep in closer touch with their New England trade Mr. H. G. Armstrong—who has been connected with their selling department for several years—is now located in Boston, his headquarters for the present being at the warehouse recently opened by the company at 246 Second street, Chelsea. Before going with the Loewenthal Co. Mr. Armstrong was associated for a number of years with the selling department of the United States Rubber Co., and is very well known in the rubber trade both east and west. There are quite a good many exceedingly high grade people in Boston, and Mr. Armstrong will add one to that number.

MR. A. B. GEORGE RESIGNS.

Mr. A. B. George has resigned the position which he has held for many years as president and treasurer of the Des Moines Rubber Co., his resignation to take effect December 31 next. He will be succeeded by Mr. T. J. Needham as president, and Mr. A. D. Skinner as treasurer—men well qualified with long experience in rubber salesmanship to conduct the affairs of this company successfully. Mr. George built up a very substantial business in Des Moines many years ago and has maintained it, and added to it year after year by his industry, good judgment and personal popularity.

THE RUBBER RECLAIMERS DINE.

The Rubber Reclaimers' Club held its anual meeting on November 6 at the Belmont, New York. Mr. F. H. Appleton, of F. H. Appleton & Son, Boston, was re-elected president, the other officers elected being: Treasurer, Mr. R. W. Seabury, Boonton Rubber Manufacturing Co., Boonton, New Jersey, and secretary, Mr. J. A. Norman, New York Rubber Reclaiming Co., New York. The meeting was followed by an elaborate luncheon at the hotel, which was greatly enjoyed by the members of the club.

DIVIDENDS.

A regular annual cash dividend of 12 per cent. has been paid by the Goodyear Tire & Rubber Co. on common stock of record on November 1.

The Hood Rubber Co. paid on November 1 a regular quarterly dividend of 1¾ per cent. on its preferred stock of record on October 31.

The directors of the Boston Woven Hose & Rubber Co. have declared a semi-annual dividend of $3.00 per share on the preferred stock, and a quarterly dividend of $3.00 per share on the common stock, both payable December 15, 1913, to stockholders of record December 5, 1913.

The exports of tires from the United States for the first eight months of 1913 amounted to $2,922,200, an increase of $681,374 over the corresponding period of 1912. The tire exports for August were valued at $377,031, a decrease of $28,750 from the August, 1912, exports.

News of the American Rubber Trade.

THE REPUBLIC RUBBER CO. IN NEW YORK.

THE Republic Rubber Co., of Youngstown, Ohio, announces that it has acquired control of the Republic Rubber Co. of New York, formerly owned and managed by New York people. The new organization, keeping the same location, 229 West Fifty-Eighth street, will carry a complete line of tires and mechanical rubber goods manufactured by the Republic company. Mr. F. G. Hill, secretary and sales manager of the old company, will continue in the same capacity in the new organization, and have charge of all tire sales. Mr. C. W. Hardin, formerly eastern manager of the Republic Rubber Co., has been elected vice-president and treasurer of the new organization, and will have charge of all the mechanical sales. These changes denote increased business at this important point, and also mean even better service for New York users of Republic tires.

THE NEW HARTFORD COOLING PLANT.

The Hartford Rubber Works are installing a complete plant for cooling the water used in the mill room. This application of the principle of refrigeration to maintain a low temperature in the rolls of rubber machinery is both novel and interesting. The cost of installation, tho great, will be saved many times over through the economies peculiar to the new system, while the benefit to the rubber stock will be incalculable. Another valuable feature showing a deep interest in the welfare of the operations will be plenty of cool and absolutely pure drinking water for the employes.

INTERCONTINENTAL RETIRES ITS PREFERRED STOCK.

At a special meeting of the stockholders of the Intercontinental Rubber Co., held November 11, it was voted to decrease the capital stock by retiring the $1,250,000 par value of preferred stock remaining issued and outstanding. The stock and stock trust certificates representing same will be retired on December 1, 1913. This will leave the preferred stock authorized $5,800,000, with none outstanding, and common stock authorized $30,000,000 with $29,030,000 outstanding. After effecting this retirement of preferred stock the company will have about $1,500,000 in cash, and cash invested in securities other than those of its subsidiary companies; so there will be ample cash resources for future operation.

CONTRACTS AWARDED FOR FIRE HOSE.

The Eureka Fire Hose Co., of New York, has recently been awarded contracts to supply 2,000 feet of fire hose to the town of Pine Bluff, Arkansas, and to the town of Pekin, Illinois, 500 feet of "Keystone" hose. The New Jersey Car Spring & Rubber Co. has secured an award from the town of Chippewa Falls, Wisconsin, for 500 feet of fire hose.

THE ANGLO-AMERICAN RUBBER CORPORATION.

The Anglo-American Rubber Corporation is a newly organized company with a capital of $75,000, which will commence operation in Brooklyn on December 1. The new company will make rubber clothing, drug sundries, hospital sheetings and auto top fabrics. The officers are R. F. Rubens, president; George L. Fox, treasurer, and F. B. Daniells, secretary. The rubber clothing department will be in charge of F. B. Daniells, while Joseph Holland, formerly with the Goodyear Tire & Rubber Co., Akron, Ohio, Davol Rubber Co. at Providence, Rhode Island, and other well-known concerns, will have charge of the druggist sundries department.

The rubber clothing will be made under a special process, and with an especially prepared cement, which will be guaranteed to prevent the opening of seams and oxidation. The plant is located in the Bush Terminal Building, Brooklyn.

A NEW FACTORY FOR MULCONROY COMPANY.

The Mulconroy Co., of Philadelphia, patentees and manufacturers of a flexible metallic hose, also of rubber boots, belting, packing and mechanical rubber goods, have secured the building formerly occupied by the Munyon Home Remedy Co. at 53rd and Jefferson streets, that city, affording them considerable additional manufacturing space. This is a three-story building, 150 x 250 feet, on the main line of the Pennsylvania Railroad, opposite the 52d street station, and within two blocks of the Pennsylvania freight station and express companies, with a siding to the factory. It is within fifteen minutes of the center of the city, with car service every quarter of an hour, so that the company will hereafter be excellently situated to take care of both the manufacture and distribution of its products.

FURTHER ADDITIONS TO FEDERAL CO.'S PLANT.

Altho the present plant of the Federal Rubber Manufacturing Co. at Cudahy, Wisconsin, contains 300,000 square feet of floor space, turns out 1,000 pneumatic tires a day, in addition to a variety of mechanical rubber goods, and affords employment to 1,000 persons, this capacity has been found inadequate to take care of the steadily increasing business of the company, and still further additions have been started. In December, 1912, this company issued $1,000,000 additional capital stock, its previous capitalization having been $1,000,000.

SUMMIT RUBBER CO. INCREASE.

The Summit Rubber Co. of Barberton, Ohio, has found it necessary to increase its capital stock from $50,000 to $100,000, and it is stated that present conditions indicate the necessity of adding to the capactiy of the plant in the early spring. This company manufactures drug sundries and rubber coated rust-proof corset stays and intends to add to its output in the near future some new patented articles for which it has already contracted. Its present factory building is 75 x 90 feet, two stories high, with an additional storage building.

ASBESTOS & RUBBER WORKS OF NEW JERSEY.

All the assets, liabilities, and contracts, the good-will and factory of the Asbestos & Rubber Works of America have been taken over by the Asbestos & Rubber Works of New Jersey, which was duly incorporated under the laws of the State of New Jersey on November 6. The officers of this company are: John H. Scudder (president of the First National Bank of Trenton), president; Joseph A. Whitney, secretary; John M. Scudder, treasurer.

TRADE NEWS NOTES.

Work has been begun on a one-story addition to the plant of the Vulcanized Products Co. at Muskegon, Michigan. This new building is to be 100 x 150 feet, and will be used as a press room.

The Loewenthal Co., of New York, has assigned Mr. M. S. Schulman to take exclusive charge of the Trenton district in order to give proper service to their customers among the mills of that section. Mr. Schulman has been associated with the Loewenthal Co. for several years, and has had much experience in the scrap rubber line.

The Automobile Tire Co. opened two new branches last month —one in Washington, D. C., and one in Fresno, California. They now have six branches besides their main office on Broadway, New York. They deal exclusively in automobile tires.

THE PATTERSON RUBBER CO.

This is a reproduction of the new mill room of the Patterson Rubber Co., situated in Lowell. The president of this company is Mr. John S. Patterson, who was for many years connected with the Revere Rubber Co., and he has associated with him Mr. F. H. Appleton, the widely known dealer in reclaimed rubber, of Boston. Before locating the plant at Lowell, Mr. Appleton corresponded with nearly 300 boards of trade located in New England, and Lowell was finally selected as offering the most favorable

MILL ROOM AT PATTERSON RUBBER CO.

location, all things considered, for the new factory. The land—nearly nine acres—was purchased in September, 1912. This was followed by a contract for a factory 260 by 65 feet, four stories in height and a boiler house 65 by 100 feet, two stories in height. Building was started in the fall of 1912, and was fully completed in May, 1913. Modern machinery was rapidly installed, and the factory opened for business on May 25, starting with the employment of 400 men, its total capacity being 1,000 men.

CONSOLIDATED RUBBER TIRE CO.

Application has been made to list the securities of the Consolidated Rubber Tire Co. on the Stock Exchange at Cleveland, Ohio. The Kelly-Springfield Tire Co. and the Buckeye Rubber Co. are subsidiaries of this concern, whose outstanding securities are placed at $8,000,000, of which common stock represents $4,000,000, preferred stock $1,149,500 and income debentures $2,850,500. This company's securities have for some time been listed on the New York Curb.

THE NATIONAL REGISTRATION LEAGUE DINES.

The members of the National Registration League and many of their friends interested in the general subject of copyright and the protection of trade-marks and designs, met for a dinner on the afternoon of November 21 at the Hotel Astor, New York. There were a number of well-known speakers, the principal subject discussed being the new Kahn law, referred to at some length editorially in the November issue of this publication.

A LIZARD IN THE RUBBER.

Upon opening up a consignment of rubber lately received from Ceylon, employes of the Mansfield Tire & Rubber Co., of Mansfield, Ohio, were somewhat startled to discover a live lizard, about 10 inches long, which had evidently come all the way from that island, having been packed in with the rubber. Fortunately it proved to be a specimen of a harmless variety.

WATCHING THE TARIFF BEFORE EXPANDING.

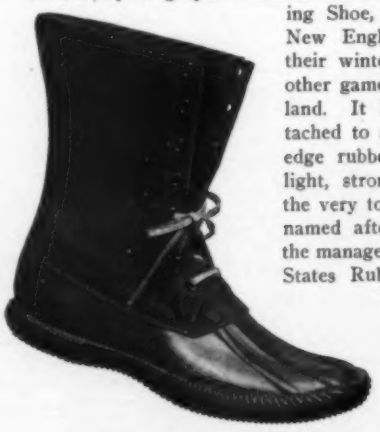
The Howe Rubber Co., of New Brunswick, New Jersey, which had planned to increase its plant by the addition of a sizable tire department, has concluded not to do so at the present time, but rather to wait until next spring, in order to see what effect the new tariff on tires will have on the trade. The company's attorney wrote to the common council of the city as follows: "The directors of the company deem it advisable, in view of the new tariff law reducing the schedule from 35 to 10 per cent. on tires, to await further action in respect to the purchase of the proposed site until spring, so as to ascertain to what extent foreign manufacturers have invaded this market and the effect it may have on current prices."

A NATIONAL ASSOCIATION OF PURCHASING AGENTS.

An organization was formed in New York City in October called the National Association of Purchasing Agents. It began with over 100 members, representing many large industrial corporations, railroads, steamship lines and electrical companies, and the membership has increased quite rapidly during its month of existence. The temporary chairman is H. T. Leeming, of Thomas A. Edison, Inc., and the temporary secretary and treasurer—who was also the organizer of the association—is Elwood B. Hendricks, connected for a number of years with Hendricks' Commercial Register. The association will be devoted to the interests of purchasing agents and buyers and has for its object mutual acquaintance, exchange of ideas, standardization of purchasing methods, investigation of new appliances and materials, methods for diffusion of market information, standardizing of specifications and other features which will be beneficial to the average purchasing agent. Inquiries should be addressed to the secretary, E. B. Hendricks, P. O. Box 1406, New York City.

THE BARKER HUNTING SHOE.

Here is a photographic illustration of the famous Barker Hunting Shoe, worn by thousands of New England sportsmen during their winter visits to Maine and other game sections of New England. It has a leather top, attached to a ribbed, low heel, roll edge rubber over. This shoe is light, strong, and waterproof to the very top. Incidentally, it was named after Mr. W. E. Barker, the manager of sales of the United States Rubber Co. It is distributed in large quantities by the Enterprise Rubber Co. of Boston, of which W. L. Proctor is the general manager.



SEALING TREATMENT FOR HEALING PUNCTURES.

Among the various articles on the market for the prevention and cure of punctures in pneumatic tires is a composition known as Rubberstone. This substance is put up in cans in a semi-liquid form and is injected into the inner tube. When a puncture occurs and the obstruction is withdrawn, the air in the tube forces a very small quantity of the Rubberstone into the hole and closes it immediately, so that the pressure in the tire is not reduced. The tube is not filled with the substance, but only enough is introduced to cover the inner surface. It not only seals the inner tube, but closes the hole in the casing as well, congealing as soon as it comes in contact with the outer air; but it does not stick the tube and casing together. [Buffalo Specialty Co., Buffalo, New York.]

TRADE NEWS NOTES.

The Braender Rubber & Tire Co. is adding to its plant on Paterson avenue, Rutherford, New Jersey, work having been started on a new factory building.

Baker & Hamilton, of San Francisco, have recently been given the agency for the new Savage tire in northern California.

Contracts to furnish supplies for forty-one motor-trucks recently purchased by the government for use in various cities in the parcel post service, for the remainder of the fiscal year ending June 30, 1914, have recently been awarded to the B. F. Goodrich Co., Motz Tire & Rubber Co., and the United States Tire Co.

The Easyride Tire Filler Co., formerly located in New Orleans, has removed to 123 Locust street, St. Louis. Missouri, where headquarters have been established for the sale of its new tire-filling material known as "Easyride."

Reports on a test of fire hose recently purchased by the city of Davenport, Iowa, from the Manhattan Rubber Manufacturing Co., of Passaic, New Jersey, indicate an excellent showing for this company's product. In this test, made before fire commissioner, chiefs, etc., the hose is said to have stretched only 50 inches in 50 feet, which is 14 inches less than the allowance by fire underwriters' regulations.

The cost and inconvenience of the necessary frequent replacing of planks in the promenade at Atlantic City has led to a decision on the part of the city rulers to cover certain sections of the walk with a preparation of rubber, and, this experiment showing satisfactory results, to extend its use over the entire length of the promenade.

A new company has been formed in Canada for the manufacture of rubber tires. It has been incorporated with a capital stock of $40,000, under the name of The Michelin Tire Co. of Canada, Limited, Montreal, the list of incorporators including A. E. Woodworth and A. B. Wright.

The Northland Rubber Co., with J. Clark Milsom as general manager, has opened salesrooms at 1239 Main street, Buffalo, New York.

A tire factory is soon to be erected at Macon, Georgia, for the Southern Tire & Rubber Co., which, when completed, will be operated under the management of H. Dech.

The Ford Motor Co. is to establish an agency at Buenos Aires in South America, with the E. H. Hampton Co. of that place.

The Walpole Tire & Rubber Co.'s salesroom, recently removed from Boston to Cambridge, will again be established in the former city upon the completion of a building now under course of erection more favorably located and arranged to meet the requirements of the tire business.

The Progressive Tire Co., Limited, with headquarters at 137 Church street, Toronto, Ontario, has secured a Canadian agency for Ajax tires.

At a meeting of directors of the Alliance Rubber Co., held at the company's office at Alliance, Ohio, on November 1, it was decided to call a meeting of stockholders for December 1 to consider a $50,000 increase in capitalization over the present $100,000 capital stock.

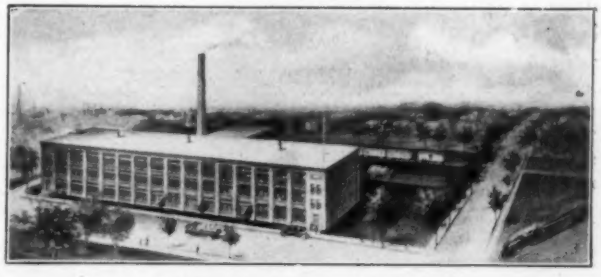
A new brake lining known as "Bestbestos" is being introduced by the Federal Asbestos Co., of Paterson, New Jersey. This is made of closely woven asbestos and is said to be unaffected by oil, gasolene, grease or acid.

Contracts have been awarded by the Consolidated Rubber Co., of Calgary, Alberta, for the erection of a five-story warehouse, to be built of reinforced concrete, at an estimated cost of $100,000.

The New England Cable Co. has been organized at Lowell, Massachusetts, with D. J. Macdougal, president, and Samuel Dunsford, treasurer and general manager, for the manufacture of cables for electrical purposes, etc. Mr. Dunsford was formerly very prominently identified with the Lowell Insulated Wire Co., and has had long experience in this line of manufacture.

THE STANDARD WOVEN FABRIC CO.'S NEW PLANT.

THE Standard Woven Fabric Co. is now located in its new factory at South Framingham, Massachusetts. Its expansion started three years ago when the present management bought out the Multiple Woven Hose & Rubber Co., manufacturers of fire hose and belting. After this reorganization the new company



STANDARD'S NEW FACTORY AT SOUTH FRAMINGHAM.

began rapidly to extend its lines in the manufacture of friction materials and woven mechanical fabrics of every kind.

Perhaps the best known of the company's products are its "Bi-Moore" and "Solid Multiple" grades of hose fabric. The "Bi-Moore" is a two-ply fabric, both jackets being woven and bound together on the loom at a single operation. The two jackets are secured together for a part only of their circumference, leaving hinged sections at opposite sides of the fabric. This feature affords lightness and flexibility and maximum resistance to water pressure. The "Solid Multiple" grade of fabric is similar in weave and form to the "Bi-Moore" grade. Its chief point of difference is that its two jackets are bound together with binding warps throughout their entire circumference.

All of the machinery which has been installed in the new plant is of the most modern and advanced type. It is particularly interesting to note that every one of the machines in the weave room was made in its own machine shop under design and direction of Mr. E. E. Waite, the factory manager, and under patents held by the company. Special machines and processes for the treatment of the finished fabric are also provided.

The building itself is of fireproof construction and of the type known as "the daylight factory" with a great expanse of window space. The foundations, floors and columns are reinforced concrete and the walls are brick. Power is furnished by the Boston Edison Illuminating Co., while the heating is looked after by a Robb-Brady Scotch boiler of 150 h. p. Connected with the boiler is a Sturtevant-Carrier system which insures a uniform temperature and humidity in the building the year round.

With such a thoroughly modern equipment the company will doubtless be able not only to increase its production, but to maintain high standards of quality and service.

The officers of the company are George D. Moore, president; W. B. McSkimmon, vice-president; T. J. Daley, secretary; A. H. Burdick, treasurer and general manager, and E. E. Waite, factory manager.

Much of the new equipment has been paid for out of the company's earnings, altho additional preferred stock for more than $100,000 has been issued in this connection. The authorized capital of the corporation is $400,000. All of the stock which has been issued so far has been sold privately and is held by men connected with the active management.

REPORT OF THE WALPOLE RECEIVERS.

The co-receivers of the Walpole Tire & Rubber Co., Robert C. Fisher and Robert O. Harris, issued on November 2 a general balance sheet as of August 2, 1913, showing a deficit of $977,205.66. A brief summary is given below:

ASSETS.

Invested assets	$2,311,462
Current assets	847,343
Deferred assets	126,818
Contingent assets	276,679
Deficit	977,205
Total assets	$4,539,507

LIABILITIES.

Preferred stock outstanding	$1,801,300
Common stock outstanding	1,500,000
Coupon notes	50,933
Current liabilities	907,595
Deferred liabilities	3,000
Contingent liabilities	276,679
Total liabilities	$4,539,507

The invested assets include:

Real estate, construction, machinery and factory equipment, at Walpole	$839,164.83
Machinery, factory equipment and building improvements in Foxboro	110,349.56
Capital stock in subsidiary companies	500,000.00
Patents, trade-marks and good will	841,998.05

Current assets include:

Accounts receivable	240,344.44

Contingent assets include:

Notes receivable, discounted at banks	250,698.61

NEW INCORPORATIONS.

The Alhambra Rubber Co., October 30, 1913, under the laws of Massachusetts; authorized capital, $10,000. Incorporators: Arthur Webb, 46 Grant street; Thomas J. Glennon, 10 Green street, and Frederick W. Fitzsimmons, 45 Jefferson street—all of Milford, Massachusetts. To manufacture and deal in all goods, merchandise, etc., of which rubber is wholly or in part a component.

Asbestos and Rubber Works of New Jersey, November 6, 1913, under the laws of New Jersey; authorized capital, $50,000. Incorporators: John H. Scudder and John M. Scudder—both of Trenton, New Jersey—and Joseph A. Whitney, Merchantville, New Jersey. To manufacture, purchase, and sell all kinds of products of rubber, etc., and particularly to acquire the business now carried on by the Asbestos and Rubber Works of America, Camden, New Jersey.

Auto Tire Brokerage Co., October 25, 1913, under the laws of Kentucky; authorized capital, $5,000. Incorporators: Allen L. McCormick, Charles L. Halden, and S. Barry, all of Louisville, Kentucky. To buy and sell old and new auto tires and accessories.

Doherty Tire Co., October 8, 1913, under the laws of Maine; authorized capital, $2,000,000. Incorporators: T. L. Croteau, Albert A. Richards, and B. M. Maxwell, all of Portland, Maine. To manufacture, produce, buy, sell, and otherwise deal in all kinds of tires, rubber, rubber goods, etc.

East Rochester Packing Co., Inc., November 15, 1913; under the laws of New York; authorized capital, $25,000. Incorporators: W. Duane Smith, 370 Fiftieth street, Brooklyn, New York; Arthur T. Jones and Charles Lebrecht, both of Palmyra, New York. Location of principal office, East Rochester, New York. To manufacture asbestos and rubber packing for engines.

Endurance Tire & Rubber Co., October 3, 1913, under the laws of Massachusetts; authorized capital, $3,000. Incorporators: Wilson G. H. Randolph, 464 Riverside Drive; John H. Cooper, 165 West Eighty-third street—both of New York—and John H. Hamilton, Wollaston, Massachusetts. To manufacture and deal in all kinds of automobile tires, accessories, and rubber goods of every kind, etc.

E. H. Garcin & Co., Inc., October 29, 1913, under the laws of New York; authorized capital, $25,000. Incorporators: Edward H. Garcin, 30 West Fifty-ninth street; George E. Richards, 501 West One Hundred and Seventy-sixth stret, and George S. Fulton, 1 Liberty street—all of New York. Location of principal office, New York. To manufacture and deal in asbestos and rubber goods and products.

The Goodyear Co., Inc., November 17, 1913, under the laws of New York; authorized capital, $10,000. Incorporators: Elihu J. Zwilling, Norman J. Jacobs, and John A. O'Rourke—all of 346 Broadway, New York. Location of principal office, New York. To deal in rubber goods, etc.

Leather Tire Goods Co., Inc., November 6, 1913, under the laws of New York; authorized capital, $7,000. Incorporators: Hans Gurlitt, 1608 Broadway; H. V. Dodge and William Loebmann, both of 1610 Broadway, New York. Location of principal office, New York. To deal in automobile specialties, tires, etc.

The Michigan Tire Co., October 1, 1913, under the laws of Michigan; authorized capital, $20,000. Incorporators: Jacob Steketee, Beth Long, and Folmer W. Kehlet—all of Grand Rapids, Michigan. To buy and sell at wholesale and retail automobile tires and accessories.

New York Tire Filler Co., September 26, 1913; under the laws of Texas; authorized capital, $20,000. Incorporators: Hugh E. Prather, W. E. Wilkins, and J. J. Eckford. To buy and sell rubber tire filling for automobile wheels, pneumatic tires, etc

Patent Rubber Co., Inc., November 21, 1913; under the laws of New York; authorized capital, $50,000. Incorporators: William N. Croxton, 1123 Broadway, New York; J. George Metz, 4286 Park avenue, New York, and Charles L. Brockheim, Riverview Manor, Hastings-on-Hudson, New York. Location of principal office, New York. To manufacture tires and rubber goods.

Schick Wheel & Tire Co., July 7, 1913; under the laws of West Virginia; authorized capital, $150,000. Incorporators: Adolph Schick, J. E. Morgan and D. H. Taylor—all of Wheeling, West Virginia.

Blowers Rheubottom Rubber Co., November 13, 1913; under the laws of Delaware; authorized capital, $500,000. Incorporators: W. R. Blowers, Toronto, Canada; Allen Rheubottom, Pittsburgh, Pennsylvania, and George D. Hopkins, Wilmington, Delaware. Location of principal office, Delaware Charter Guarantee & Trust Co., Du Pont Building, Wilmington, Delaware. To manufacture and sell automobile tires, tubes, and rubber goods of all kinds.

B. F. Wade Tire & Rubber Co., October 14, 1913; under the laws of California; authorized capital, $50,000. Incorporators: B. F. Wade, Charles E. Crozier, and Helen Newman—all of Los Angeles, California. To carry on a general rubber business along automobile lines, and for all uses of rubber.

Westchester Raincoat Co. of Mount Vernon, Inc., November 17, 1913; under the laws of New York. Incorporators: Michael Waill, 462 South Fourth avenue; Harry Miller, 118 West First street, and Abraham Subotky, 18 South Eighth avenue—all of Mount Vernon, New York. Location of principal office, Mount Vernon, New York.

TRADE NEWS NOTES.

The Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, announces the removal of its New England branch from 261 Dartmouth street, Boston, to a permanent location in the company's own new building at 173 Massachusetts avenue, that city. A complete stock of Federal tires, tire accessories, horse shoe pads and mechanical rubber goods will be carried at this address, where commodious show and stock rooms have been provided, with facilities for prompt attention to orders.

The formation of a company is being considered for the continuation of the business of The Xenia Rubber Manufacturing Co. of Xenia, Ohio, in the manufacture of tires of all kinds, mechanical rubber goods, etc. The new company will probably be incorporated during February, 1914, and $60,000 is given as the amount of its capitalization.

The Fairfield Rubber Co., which recently installed electricity in part of the plant at Fairfield, Connecticut, and replaced some of the old machinery with other of later and improved design, is now adding to its equipment a new set of boilers, besides having contracted for a one-story 45 x 75 feet brick addition to the plant. The company expects also to make further important changes in the spring.

The Endurance Tire & Rubber Co. of New Brunswick, New Jersey (with general offices at 1789 Broadway, New York), has recently opened a branch at 1514 Michigan avenue, Chicago, in charge of A. W. Shattuck, in addition to the one mentioned in our November number, located at 755 Boylston street, Boston, in charge of John L. Hamilton.

The Plymouth Rubber Co., Canton, Massachusetts, instead of equipping each mill and calender with safety stops, has put electrically operated friction clutches at the drive end of each main shaft. A cord from each clutch runs over each machine in easy reach of the operator. The driver works quickly and is said never to be out of commission.

A new building has been added to the plant of the Plymouth Rubber Co., at Canton Junction, Massachusetts, for the manufacture of leatherette. The product is used by shoe, novelty, upholstery and automobile manufacturers, and is called "Plymouth Leather."

The trust agreement, under which the stock of The Boston Woven Hose & Rubber Co. has been held for the shareholders by trustees, which terminated on November 2 last, was, by a vote of the stockholders, extended for another five years, continuing until November 2, 1918.

The new factory of the Double Fabric Tire Co., at Auburn, Indiana, is now nearing completion. The main building is 84 x 140 feet, and so designed that it can readily be added to when occasion requires. It is built of brick, full mill construction, is equipped with sprinkler system, and has a vacuum plant. A 36 x 40 foot two-story building is also being added to the boiler die rooms, and Birmingham 60-inch calender, 40-inch mills and a washer are being installed.

The El Paso Rubber Vulcanizing & Auto Supply Co., Incorporated August 12, this year, at El Paso, Texas, with a capital of $10,000, by C. M. Morse, W. Morse, and C. F. Fowser, succeeds the El Paso Rubber & Auto Supply Co., first established in 1908 under the name of the El Paso Rubber Co. The purpose of this recent incorporation is to prevent the use by other companies similarly engaged in the automobile supply and accessory business of the names under which this concern has been operating.

The Eureka Resilient Wheel Co. has been incorporated at Ludlow, Kentucky, with a capital of $10,000 for the manufacture of a patented automobile wheel. The principal incorporators are G. A. Simpson, of Ludlow, and Charles Schroeder, of Cincinnati, Ohio.

Mahlow & Wyckhoff, manufacturers of hard rubber negatives and soft rubber molds, have recently removed from 325 South Warren street, Trenton, New Jersey, to Brunswick avenue, and East Trenton Railroad, in the same city.

The "Thermoid 100 per cent. Perfect Brake Lining," made by the Thermoid Rubber Co., of Trenton, New Jersey, is now used by twenty-six of the popular motor cars of the United States and Europe.

THE HARTFORD RUBBER PLANTATION.

Many rubber manufacturers here and abroad own rubber plantations situated somewhere in the tropics. It remains, however, for the Hartford Rubber Works to install their own plantation right in the factory. In the warm, light boiler room there are growing today healthy specimens of the *Hevea Brasiliensis*, *Castilloa Elastica*, and the *Ficus Elastica*. So far, these trees have

RUBBER PLANTATION OF THE HARTFORD RUBBER WORKS CO.

not been tapped, and will not be until a new tapping device projected by Mr. Whittlesey is completed.

Confidentially, the device is to be a cutting-knife attached to a vacuum extractor which will draw the latex as far as the mill room, coagulate it over the mixing mills, and automatically feed it into the rolls for massing.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

A CUSHION TIRE FOR MOTOR TRUCKS.

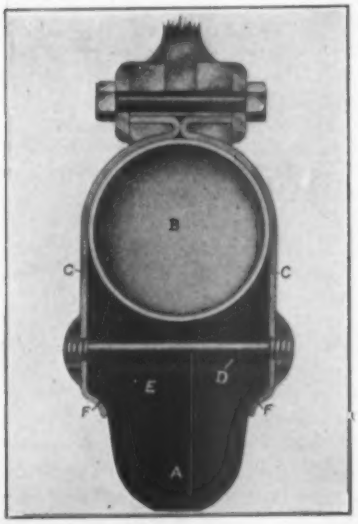
AFTER considerable experimenting on the part of the manufacturers, a solid rubber cushion truck tire has been produced with the intention of meeting the adverse conditions under which motor trucks are operated. This same type of tire has been used on electric pleasure cars for several years past, and

THE NEW MOTZ CUSHION TIRE FOR TRUCKS.

its adoption for truck use is expected to partially relieve the detrimental effects caused by the shock vibrations resulting from solid-tire equipment. In design, this type follows closely the construction of the pleasure car type, being constructed with under-cut sides which form slanting bridge. Each tire has a dual tread with a single base, and two tires may be mounted on a single wheel as shown in the cut. Extending on the inner side of each tread at regular intervals are perpendicular indentations to prevent skidding. This non-skid feature, it is claimed, will remain effective until the tire yields its guarantee mileage, which is for 10,000 miles, or for one year. [Motz Tire & Rubber Co., Akron, Ohio.]

PUNCTURE-PROOF PNEUMATIC TIRE.

A tire embodying the ordinary inner tube feature of the usual type and yet laying claim to being absolutely puncture proof, has been recently placed on the market. In the illustration, *A* represents the flexible rubber tread which is made all in one piece. *B* is an ordinary inner tube as used in most pneumatic tires. The outer tread *A* surrounds the inner tube *B* and both are held in place by the steel rims *C C*. These rims are made from vanadium steel and are attached to the felloe of the wheel by a quick-demountable device. They are held together by bolts *D* which pass through steel lined openings or slots *E* in the tread. These openings are made wider than the bolts, as shown, in order to allow for the radial movement of the tire as it strikes obstructions in the road. Shoulders *F F* are provided on the tread, against which the steel rims set, thus preventing the air pressure from forcing the tread outwardly beyond a certain point. This feature makes it impossible to throw the tire off the rim. [Detroit Pneumatic Tire Co., Detroit, Michigan.]



PUNCTURE-PROOF PNEUMATIC TIRE.

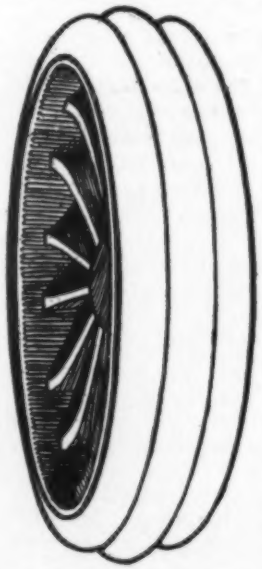
RUBBER TIRE WITH RESILIENT STEEL TREAD.

Few, if any, rubber tires have been designed that have taken the place of the pneumatic in all respects, for, with all its inherent faults, it still has obvious advantages. One of its defects is the rapid wearing out of the tread, thus exposing the fabric and making the inner tube subject to blow-outs. Many treads of various compositions have been devised for protecting the tire, but the drawing herewith shows a tire with an entirely new kind of tread. This tire, which is known as the "Stelastic," has a tread of a composite nature, combining numerous small steel springs with the rubber of the tread. The steel spirals are vulcanized in a vertical position and are placed so close together that they form a protection against wear as well as against punctures and side-slip. It is reported that in a recent test of a set of these tires by the Royal Automobile Club of London, 20,000 miles was covered without a cut, puncture, or blow-out. [Hunts, Limited, 117 Long Acre, London, W. C.]

PNEUMATIC TIRE WITH RESILIENT STEEL TREAD.

A NON-SKID TRIPLE SOLID RUBBER TIRE.

The ordinary solid rubber truck tire is usually of such homogeneous and solid construction that it lacks sufficient resiliency to relieve the machine of the heavier road shocks. Fire engines, for instance, must travel at high speed, regardless of the condition of the road, whether it be rough or smooth and slippery. The truck tire illustrated shows a new triple solid rubber band tire, which is said to add much to the resiliency and to provide safety against skidding.



THE MACINTOSH TRIPLE TIRE.

The two outer tires are of the usual solid gray rubber, while the center tire is a special soft and resilient red rubber and of a slightly larger diameter so that it stands up above the others. This combination of hard and soft rubber is said to give a resiliency hitherto unattained by the solid rubber band tire, and to secure a perfect grip on the road surface. These tires, which are made under the Coleman patent, have been adopted by the London fire brigade. [Charles Macintosh & Co., Manchester, England.]

DOMINION "NOBBY" TIRES.

The manufacture of Dominion "Nobby" tires has just been begun in the new factory of the Dominion Tire Co., Limited, situated at Berlin, Ontario, a very complete description of which, with illustration, was given in THE INDIA RUBBER WORLD of February last, when building operations began. Some idea of its size may be obtained from the fact that more than 800 tons of reinforced steel have been used in its construction, and approximately 40,000 feet of steel sash have gone into the windows. This new plant represents in its construction and equipment the combined and accumulated experience and knowledge of some of the largest rubber factories in the United States. The Dominion people express themselves with great confidence that this is "the finest tire factory in the world."

New Rubber Goods in the Market.

THE APSLEY "TANGO."

WHEN our forefathers and our foremothers used to dance the stately minuet they never dreamed that their descendants would some day go over the dancing floor with such rapidity, with so many leaps and so many dips and so many other swift and sudden movements, that they would have to wear rubbers in order to keep their feet. But all this has come about. In place of the stately minuet and the innocuous Virginia reel, everybody now is dancing the Tango, or something else equally full of motion. Just how long these dances will remain popular cannot be prophesied, but probably for some time, their popularity appearing to increase nightly.

THE WOMEN'S "TANGO" RUBBER.

The shoemakers have cudgeled their brains to provide the best sort of footwear to meet the new conditions. Some have inserted a rubber patch in the toe, and some in the center of the sole; but here comes the Apsley Rubber Co. with the "Tango" rubber that appears to meet the situation admirably. It is invisible and almost imponderable. When put on the dancing pump it is unobserved, and as each rubber weighs but an ounce its weight is not a serious consideration. It has a very light rubber sole with just enough upper to catch on the edge of the leather sole. The sole runs up under the arch of the foot, where a little metal socket fits over a metal button that has previously been pressed into the arch of the leather shoe. These Tangos can be put on when required and put back in the pocket when not required. This is no theoretical shoe, as it has been thoroughly tested on the dance floor. The Apsley company expects a very large sale on these shoes this season, and assuming that society continues to cherish the Tango, their expectations will undoubtedly be realized. [Apsley Rubber Co., Hudson, Massachusetts.]

THE MEN'S "TANGO" RUBBER.

THE GOODYEAR CO.'S FLEXIBLE METALLIC HOSE.

In setting forth its claim to superiority over ordinary varieties of metallic hose and those made of rubber alone, the Goodyear Tire & Rubber Co. calls attention to the extreme flexibility of its "Kantkink" metallic hose, its durability and resistance to high pressure. This hose is provided with an interlocking metallic casing which completely surrounds the inside regular hose tube and which, while protecting the latter from destructive kinks, in no way detracts from its adaptability. The inner tube sustains the pressure, and it is asserted that an amount equal to 1,000 pounds to the square inch has been exerted in test cases without bursting the hose.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude and Compounding Ingredients."

RUBBER AND FABRIC SLEEVE FOR BLOW-OUTS.

Another device introduced for the purpose of assisting the motorist in case of tire trouble is a new form of blow-out sleeve with flaps for fixing in place. This sleeve consists of several layers of cotton duck securely vulcanized together. The flaps are intended to be placed between the bead on the casing and the rim to prevent the sleeve from slipping. It contains seven plies of fabric and forms an effective bridge under the blow-out. These plies of fabric are cut on the bias to prevent the flaps from tearing off and to form a strong protection to the inner tube. The sleeve is made in six sizes to fit any tire. [Essex Rubber Co., Trenton, New Jersey.]

BLOW-OUT SLEEVE WITH SIDE FLAPS.

RUBBER IN RESPIRATOR CONSTRUCTION.

Of recent years much attention has been given to the development of respirating apparatus to enable rescuers in mine or fire disasters to breathe comfortably in air filled with smoke, dust, or poisonous gases. One of the simpler forms of these devices is shown in the accompanying cut. This respirator is made in one piece, of air-tight rubber fabric, and covers the whole face. It is fitted with a sponge which thoroughly filters the air supplied. The eye pieces are equipped with a slide-cleaning arrangement which enables the operator to clean the glass on the inside while in use. A tight fit against the face is secured by a pneumatic cushion which is inflated previous to its use and controlled by a small stop cock. [S. F. Hayward & Co., 39 Park Place, New York.]

HOW THE RESPIRATOR IS WORN.

MAKING WORK EASY FOR THE PLUMBER.

Heretofore, great difficulty has always been experienced in cleaning out stopped-up sewers and drain pipes where the pressure of the water or other liquid alone was insufficient to remove the obstacle. The device shown in the illustration has been designed to do the work of cleaning out these pipes by merely applying it to the end of the pipe and attaching a hose to one end of the brass connection. The body of the device is one continuous piece of flexible rubber vulcanized in the form of a choked cylinder. Either end of the cleaner can be used by attaching the hose to the opposite end of the brass nipple. It is made in 4 and 6-inch sizes, and may be used for any size of pipe up to these dimensions. [Davenport Manufacturing Co., Davenport, Iowa.]

THE SCHICK SEWER CLEANER.

AN AUTOMOBILE TOP MADE OF RUBBER.

A Boston manufacturer is introducing an automobile top constructed of rubber and fabric. This new material is known as "Neverleek," and is described by its maker as absolutely waterproof without time limit, in any climate, and under all weather

CAR EQUIPPED WITH "NEVERLEEK" TOP.

conditions. It is also claimed that the material cannot shrink or wrinkle and that it will retain its luster. The coating of rubber is spread over a heavy layer of fabric in such a manner that the finished product forms a tough, leatherlike substance which will not crack like oilcloth or other fabrics containing no rubber. [F. S. Carr Co., Boston, Massachusetts.]

RENEWING TEETH IN A RUBBER COMB.

A great many hard rubber combs are stamped "Non-breakable," which is quite true if they are handled with proper care. But everybody probably has had had the experience of seeing the non-breakable rubber comb drop from his hand and strike the edge of the marble wash-stand or the rim of the porcelain bath-tub and bound off with the loss of several teeth. To provide for such exigencies some thoughtful person has devised a hard rubber comb in which the teeth are fitted down into the back and held in place by a removable strip that fits into the top of the back. If some of the teeth are broken the comb can be put on a hot plate, where the back expands sufficiently to permit the removal of the holding strip, when new teeth are inserted in place, the strip replaced and the comb made whole again. This is interesting, but the probability is that most people will go on taking their chances with the old comb, buying a new one after too many teeth have been broken out.

MOTOR LAMP WITH RUBBER BODY.

Considerable attention is being attracted by a new electric lamp which, instead of being made with the usual casing of pressed metal, has a body and base made entirely of hard rubber. The lamp is made for either automobiles or motor boats and may be operated on the ordinary storage battery or by six dry batteries. The rubber base and body are molded under hydraulic pressure. Unlike metal lamps, this lamp cannot tarnish and needs no polishing; also it is not easily dented and presents a very neat appearance when installed in a car or boat. In case the body or base is broken through accident, it is easily and cheaply replaced.

It is stated that a set of four lamps, with two extra tungsten bulbs, can be installed for $12, which is a low cost as compared with the usual system now in use. [H. W. Johns-Manville Co., New York.]

WATERPROOF GARMENTS FOR THE SPORTSMAN.

DURING the fall and winter months it is essential, both for the sake of comfort and health, that the sportsman protect himself from storm and exposure. For this purpose there is no lack of means, as is testified to by the great variety of rubber boots, shoes, leggings, coats, caps, etc., that are constantly being placed on the market by manufacturers. These goods are not all old, however, for they are being brought out in new forms, styles and finishes every season. For instance, Fig. 1 shows a new fishing and outing hat that may be worn both in sun and rain. One side of the brim is extended to form a watershed to cover the neck in case of rain, while this same extension may be placed in front to protect the eyes from the sun in clear weather. The cloth of which the hat is made is rubberized and absolutely waterproof.

FIG. 1. A RUBBERIZED HUNTING CAP.

Another hat serving the same purpose as the one above is made with a khaki or corduroy covering and a rubberized lining which makes it waterproof. The outer covering makes the hat "dressy" in appearance, while it affords protection at the same time. A feature which will appeal to hunters in cold climates is an extra lining of fur which may be pulled down over the ears. The rim may also be turned down to protect from rain or snow. Altogether, this is one of the most practical hunting caps ever made.

FIG. 2. RUBBER LEGGINGS WITH APRON FRONT.

Going from head coverings to the other extreme, we see in Fig. 2 a pair of rubber leggings of unusual length, with the additional feature of an apronlike extension in front. The apron is provided with belt straps which serve to hold the garment in position. Down the side of each lower leg portion is a row of clasps by means of which the legging is securely and tightly fastened as shown in the illustration.

Another new hunting garment that depends upon rubber for a part of its construction is a leather-lined coat with leather sleeves, and with knitted neck and wrist bands. Running up the back is a rubber elastic box plait which gives the coat a snug fit and at the same time allows freedom of action. This coat is ideal for protection from cold while hunting, automobiling, or engaging in other outdoor sports, and no doubt it could also be made to do even better service as a protection from rain, by impregnating the cloth of the body with rubber.

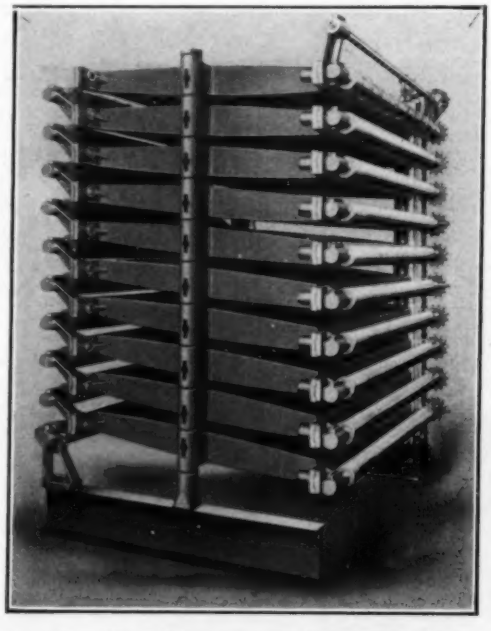
DRY STORAGE FOR TENNIS BALLS.

There has recently been put on the market a new air-tight box which is said to successfully overcome the decomposition that usually takes place in a rubber tennis ball after its initial use. This box is cylindrical in shape and is lined with a preparation specially designed to absorb all the dampness which the ball may have taken on during a game, and to which is due in great measure its premature deterioration. The tennis player who makes use of this box will find the ball when next taken out to be as good as new, and that its life will be much prolonged.

New Machines and Appliances.

A CELL DRYING MACHINE.

IN the accompanying illustration is shown a cell drying machine which is used by a number of prominent tire and rubber manufacturers for removing moisture from the fabric before it is combined with rubber. The machine shown consists of ten cells or units, each 62 inches wide and 52 inches long in the direction of the cloth travel. These driers, however, are made with any desired number of units. Each cell is a hollow cast-iron box heated by steam, circulation being effected by baffle plates inside the cell. The fabric is drawn by brass rollers over the heated surfaces of the cells, running first over the top cell and then being drawn over its under surface, then over the top of the second cell and so on until it leaves the bottom cell in a perfectly dry condition. The machine takes but a fraction of the floor space necessary for the old types of cylinder and steam coil driers. The brass rolls are driven by an endless roller chain with a very small amount of friction. One feature of this drier which may be appreciated by new factories is the unit construction which permits of a machine of small capacity being installed at the start and then, as necessity requires, the machine

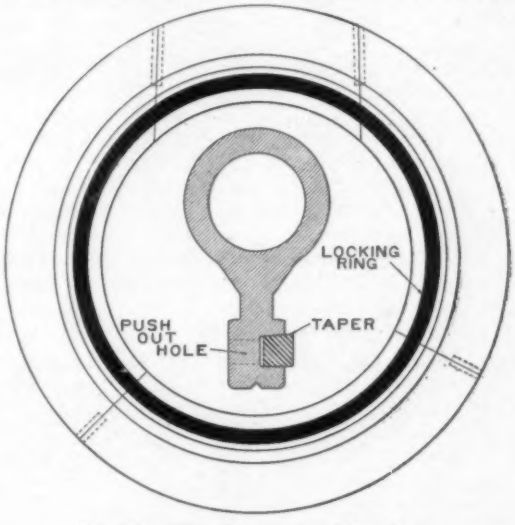


TEN CELL MACHINE FOR DRYING FABRIC.

is given an increased capacity by merely adding other cells at the top of the existing machine. [Cell Drier Machine Co., Taunton, Massachusetts.]

COLLAPSIBLE CORE FOR TIRE BUILDING.

What is claimed to be a radical improvement in the construction of tire building cores, has just been introduced to the rubber trade. Since the introduction of the quick detachable tire, most of this type have been built up on various kinds of collapsible cores, the principal one of which was the double ring type. This new core, however, it is claimed; is an improvement over the double ring type, in that it can be assembled or taken apart in a few seconds, is more durable, retains its shape and is as cheap to manufacture. Like other collapsible cores, this new device, which is termed the "Simplex," is sawed into four sections and is provided with keys and end slots to guard against transverse movements of the sections. The novel feature is the single locking ring which is held in place by leverage and friction only. A circumferential groove with one



THE SIMPLEX COLLAPSIBLE TIRE CORE.

side tapered is machined into the tongue of each core section and a steel ring is fitted into this groove. When the four sections are placed together and the locking ring forced home, the core is drawn up into a perfect circle. The ring prevents radial movement in or out, while the keys in the ends of the sections hold them in alignment. Holes drilled behind the groove afford means of forcing out the ring when the core is to be collapsed. Only five parts are used in the construction of the whole apparatus. Altho this core has been on the market only a short time, it is reported by the manufacturers that more than 500 are now being used in tire factories. [Williams Foundry & Machine Co., Akron, Ohio.]

WRAPPING TIRES BY HAND.

In retreading tires, in the garage or repair shop, the operation is customarily performed by applying the bandage as tightly as possible directly from the hands. This requires skilled workmanship as well as considerable physical strength, and often results in uneven pressures being produced in different parts of the tire. To overcome this difficulty, the hard-operated retreader shown in the illustration has been designed.

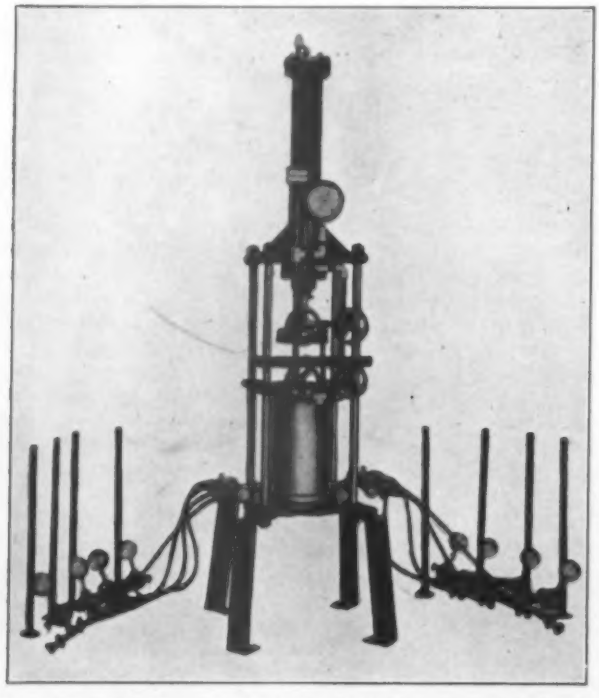
In operation, the wet bandage, tightly wound on its spool, is dropped into a recessed slot in the frame and the pressure arm is released against the bandage. A portion of the bandage is unwound and passed through the guides and once around the tire, establishing an overlap to secure the end. The tire is secured in a horizontal position, as shown, and the roller arm clasped around it. Then the machine is simply rotated, causing the bandage to be drawn from the spool and tightly wrapped around the tire. The average tire requires about three 20-yard bandages, depending upon the amount of overlap, which is regulated at will by the operator. The machine will wrap any tire from 2½ to 6 inches in size. In order that the tire be wrapped very tightly, it is necessary that the bandage itself be wound tightly upon its spindle. In order to accomplish this result, a

special winder has been designed, which stretches the bandage tightly around the spindle and passes it through water at the same time. Any desired amount of tension may be obtained in placing the tape around the tread, merely by adjusting the tension of the friction rolls. [R. G. Rossman, Seattle, Washington.]

NEW HYDRAULIC PRESS FOR FILLING TIRES.

The machine shown in the accompanying illustration is a new type of hydraulic press recently designed for filling automobile tires with a rubber compound or substitute for air, thereby producing a practically solid tire which is resilient and free from the disadvantages of the pneumatic. The press forces the material in liquid form into the inner tube under the same pressure as that used for filling with air. In a short time the liquid solidifies and forms a very soft but resilient core for the tube. The illustration shows the machine fitted with connections for filling eight tubes at the same time.

One side of the cylinder is connected by a pipe with the receptacle in which the filling material has been mixed. When the plunger rises it sucks this material into the hydraulic cylinder and a check valve prevents it from returning to the supply tank. From the cylinder it is forced into the tire through a small reinforced rubber or flexible metal hose. There is a short connection between the end of the hose and the tire, which is shut off after



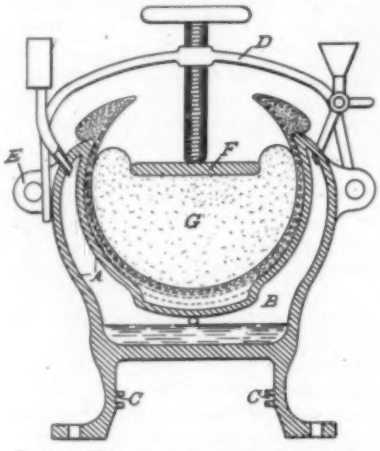
HYDRAULIC PRESS FOR FILLING TIRES WITH RUBBER COMPOUND.

the tire is filled to the desired pressure to prevent the liquid from escaping until it has had sufficient time to solidify, after which the hose is removed and the cap placed on the tire in the ordinary manner.

The press is provided with double-acting valves, and is well suited to the requirements—such as the variable pressures—necessary in this kind of work. Each hose connection is provided with a gauge, by means of which different sized tires may be filled at the same time and the operation stopped when the desired pressure has been reached. This is said to be the only press of its kind ever built, and is designed especially for this class of work. [The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.]

NEW FORM OF STEAM VULCANIZER.

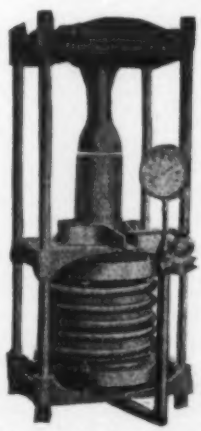
We describe briefly herewith a recent French invention relating to a new form of steam vulcanizer for repairing casings of automobile tires. In this vulcanizer the boiler is formed by the mold itself, thus doing away with the usual intermediate tubing between mold and boiler and the consequent condensation of the steam. The apparatus consists principally of the mold *A*, which on the inside conforms to the shape of the tire. The walls of the mold are hollow, constituting a steam boiler *B*. The device is set on cast iron legs which are provided with lugs *C C* for attaching gas, alcohol or other burners. The heat generated forms steam in the boiler and heats the walls of the mold, especially the interior wall with which the tire is in contact. In order that the surface of the tire be pressed firmly against the mold, two screw presses are mounted in the stirrups *D* attached to the sides at *E*, so that they press down on the plate *F* resting on a pad *G*. This pad may consist of a small bag of sand which will easily conform with the contour of the tire and hold it firmly against the hot surface of the vulcanizer. The device is provided with filling funnel, overflow valve, steam pressure gauge and safety valve.



STEAM VULCANIZER WITH SAND BAG TEMPLATE.

A RAMLESS HYDRAULIC PRESS.

In England, during the past year, there has been brought out what has been termed the "Pistonless" hydraulic press. While this name describes the machine in comparison with the usual plunger type, the cover of the working cylinder really performs the functions of a piston. The cylinder is made collapsible, and when subjected to an internal pressure it extends and provides the power for which the press is employed. The cylinder is formed of a number of steel rings connected by a flexible steel fabric which is waterproofed on the inside by means of a coating of rubber. Such a construction provides flexibility and allows a pressure of 150 pounds per square inch to be carried with safety. The principal advantage pointed out for such a system is that a cylinder of larger diameter can be employed than is possible with the ordinary plunger press. With the collapsible cylinder the amount of power required to overcome the internal friction is very small and consequently low water pressure can be employed. A force of 2 tons may be obtained with a cylinder 24 inches in diameter, acted upon by a water pressure of only 10 pounds per square inch. The illustration shows a machine having a cylinder of 2 gallons' capacity, capable of producing a working pressure of 10 tons. [R. A. Lister, Limited, Dursley, England.]



THE LISTER RAMLESS PRESS.

The Editor's Book Table.

THE PREPARATION OF PLANTATION RUBBER. BY SIDNEY Morgan, A. R. C. Sc., F. C. S. London, 1913: The Rubber Growers' Association. [Octavo, 270 pp., cloth covers; price, 10*s.* net.]

IN this comprehensive work Mr. Morgan has had the advantage of an intimate personal knowledge of the subject treated. During the past few years he has been Directing Scientific Officer for the Research Fund of the Rubber Growers' Association in the Federated Malay States.

The plan of the work combines simplicity with completeness. It deals, as its title indicates, with the preparation of plantation rubber. Its scope is best illustrated by its general contents:

Part I. Field operations.....	5 chapters	57 pages.
II. Factory operations.....	5 "	61 "
III. Machinery and buildings.	3 "	23 "
IV. Finished rubber.....	3 "	51 "
V. General	5 "	74 "
	21 chapters.	266 pages.

Each chapter has a number of subheads which are indexed, so that reference to the text is much facilitated. As it will be seen, about four-fifths of the volume deals with rubber after it has passed the initial stage of a field product and has started on its way to become an article of commerce.

Prominent among the subjects treated under "Field Operations," is that of wide as compared with close planting. Most estates are now planted upon a scale of 20 x 20 feet, 30 x 30 feet or even 40 x 20 feet. Altho these distances may seem wide in comparison with the old plan of 10 x 10 feet or 15 x 15 feet, Mr. Morgan anticipates the possibility of the present rate being in a few years deemed too close. In cases where greater distance has been secured by thinning out trees, it has been found that in a short period (in some cases six months) the yield was greater than from the same area with double the number of trees. Moreover, the growth has been more rapid, with a prospect of a proportionate increase in the future. "Tapping Systems" are next dealt with, the text being illustrated by lucid tables and charts recording actual experiments. Among the objects of the latter was to determine whether the system of tapping had any effect upon the final quality of the vulcanized rubber. The further development of the subject treats of "Tapping and Collecting," "Transport of Latex" and "General Field Operations"; bringing the reader with the latex to the door of the factory.

Commencing with the preliminary treatment of the latex, the question of coagulation is then taken up, the author expressing the opinion that, altho the oldest general coagulant, acetic acid remains one of the best and safest at the present time. There is, however, a good deal to be said in favor of formic acid, which is equally as safe and efficacious as acetic acid but costs slightly more. The strength of the acid used, in connection with the results of tests after vulcanization, is the next point treated; while the principal features of the recent controversy regarding the use of sodium bisulphite are quoted as showing that no deleterious action is exercised on rubber by that agent. At this point the preparation of sheet and of crêpe rubber is dealt with in detail; the final chapter in the section of factory operations treating the "Drying of Rubber." Under this head are to be found the various drying processes, including air and smoke drying of crêpe, vacuum driers, air, sun and smoke drying of sheet, as well as artificial driers for crêpe and sheet rubbers. Other branches of the subject include the period of drying and the fuels used for smoking.

Having fully described the field and factory operations connected with the preparation of plantation rubber, Mr. Morgan then takes up the subject of "Machinery and Buildings." With regard to the first point, he remarks that the increasing competition in machinery for the preparation of rubber will doubtless result in a continued improvement of design. The need for adequacy of the machines is forcibly urged. Finally the author recommends managers to base their final decision upon:

1. The experience of those already using the machines; 2, simplicity of parts; 3, lubrication system; 4, mode of adjusting rolls; 5, fitting of trays.

The chapters on factories and other buildings are illustrated by designs, and deal fully with the points involved.

The fourth part of the work takes up "The Finished Rubber," touching upon defects in crêpe, block and sheet rubbers, and how to avoid them; as well as the subject of comparative strengths. In this section will be found a general consideration of the comparative values of various grades of plantation rubber.

Among the features of the "General" section is a discussion of "Smoked Sheet *versus* Pale Crêpe as a Market Commodity," and also of "Plantation Rubber *versus* Fine Hard Pará." The writer objects to comparing all plantation rubber with Fine Hard Pará, as the modes of preparation are so distinct. He also shows that plantation crêpe rubber must not be compared even with plantation smoke-cured sheet rubber, which he considers the best and strongest form in which plantation rubber is prepared.

The work is throughout replete with interest, while its lucid style renders it doubly attractive to the planter, merchant and manufacturer, each of whom will find within its pages much information of both value and interest.

SCIENTIFIC AMERICAN REFERENCE BOOK, 1914. COMPILED and edited by Albert A. Hopkins and A. Russell Bond, Associate Editors of "The Scientific American." [Cloth bound, 12mo, 608 pages, 1,000 illustrations. Price, $1.50.]

Former editions of this book have already made a name for it, and the work needs little introduction. In this latest volume are gathered statistics and information concerning those things which compose the vital factors of our material and scientific progress. It is a compendium of ready reference for the busy man, containing a vast aggregation of facts and figures regarding the fields of industry, commerce, arts, and science. Much of the information contained therein could not be found elsewhere without much trouble and inconvenience. For instance, in the summary of manufactures, the number of persons engaged, the horse power used, and the value of the finished products are given for the rubber as well as for hundreds of other industries. There is also a detailed comparison of a year's production of rubber in tons from all of the world's rubber-producing countries.

FACTOS ECONOMICOS (ECONOMIC FACTS). BY DR. MIGUEL Calmon du Pin e Almeida, Professor at the Bahia Polytechnic School, 1913. Rio de Janeiro: Livraria Francisco Alves. [Octavo, 432 pp., paper covers.]

In this comprehensive volume, printed in Portuguese, the author has grouped a number of facts bearing on various subjects in which he has been interested during his professional career.

The sections of a general character include that on "The Influence of Solidarity on National Agriculture," "Politics and Economic Development," and "Instruction as a Factor of Industrial Progress." Among the special subjects treated are "Alcoholism and the Industrial Utilization of Alcohol" and "Two Methods of Producing Tobacco in the East." In another section is treated the "Valorization of Coffee"; all of these subjects being dealt with in practical shape.

The chapter devoted to "The Depreciation of Rubber" recalls

various facts, which are presented in new lights. It is supplemented by detailed notes on "The Planting of Rubber in the East and Amazonia," "The Future of Synthetic and Natural Rubber," and "Data of Rubber Production and Commerce." Finally, two notes deal with a "Project of Law Affecting Rubber" and a "Project of Law as to Public Instruction."

In view of the wide scope of this work, the author must be complimented on the extensive ground he has covered, and its consequent value as a text book on the subjects dealt with. The volume is highly creditable to its author.

Some of its chapters dealing with rubber will be subsequently treated at greater length.

BELGO-BRAZILIAN CHAMBER OF COMMERCE, BRUSSELS.

Through the special "Bulletin" of the above body, now in its second year, an idea may be formed of the present development of trade between Belgium and Brazil. Manufactures of rubber equaled exports—$7,600 (gold) for 1911, and $37,000 for 1912. Crude rubber imports represented—1911, $23,800; 1912, $105,400. Thus business in each direction increased more than four-fold between 1911 and 1912.

One of the most appropriate and interesting articles is that of Baron d'Anthonard, special envoy of France to Brazil. He expresses the opinion that the English are taking the lead in that country through their initiative and solidarity, while the Germans are implanting themselves through their diligence and the adaptability of their commercial methods. The French, he adds, are divided and isolated, struggling against these obstacles, but putting money in the country in the form of loans.

Professor Rodrigo Octavio, a jurist of Rio de Janeiro, discusses the condition of foreigners in Brazil.

M. Jules Tilmans, secretary of the Association of Rubber Planters, Antwerp, urges the particular advantages of that port, the commerce of which he shows for the past ten years. During that time the vessels entering the harbor increased in number 20 per cent., while the tonnage rose 50 per cent. In this augmentation rubber held an important position.

In an attractive article M. Armand le Dent, Technical Counselor at the Ministry of Agriculture, Rio, describes the many beauties of that port, his text being embellished by tasteful illustrations. Similar artistic engravings are scattered through the "Bulletin," showing the choicest scenes of Rio and Sao Paulo.

Other items of interest comprise a sketch of "A Modern Fleet" with reproductions of Brazil's well-known "Dreadnaughts" and other elements of modern naval warfare.

The design and execution of the "Bulletin" reflect great credit on its authors.

THE TIRED MAN OF THE MICHELIN COMPANY.

The Michelin Tire Co. has recently been illuminating its advertising matter by the portraiture of a personage called "Bibendum." One of these portraits is reproduced herewith, and it shows him in a tired condition from the crown of his head to his feet. It will be noticed that he possesses an aldermanic contour, indicative of prosperity and general satisfaction with life. It will be noted, also, that he is always depicted smoking. Presumably he is smoking a cigar made of palm nuts, the smoke of which, as is well known in the rubber trade, is believed to give great nerve to the rubber.

NEW TRADE PUBLICATIONS.

A NEW FEDERAL RUBBER COMPANY FOLDER.

AMONG the interesting and attractive publications recently received is one of four pages, large newspaper size, issued by the Federal Rubber Manufacturing Co. of Milwaukee, Wisconsin, which describes in detail and effectively illustrates the remarkable development of the company's business and the growth of its plant, since its incorporation in 1911, from four buildings and power plant to 18 modern structures with floor space of approximately 300,000 square feet.

On the front page are reproduced photographs of the company's offices and of department managers and officials, the plant at Cudahy as it appeared two years ago, one year ago and a drawing showing how it will appear when the work of construction commenced this year has been completed. Page 2 is devoted to illustration of the general office building and to 8 photographic reproductions of administrative, executive and general offices. Page 3 is occupied by 15 excellent photographs of factory interiors—machine-shop, calender-room, testing and research departments of laboratory, fabric coating room, tire building department, wareroom, etc., etc. The last page shows 12 of the company's 45 branches and service stations, with portraits of their managers, these various branches being located in the 12 principal cities between Boston and San Francisco.

Another folder or "broadside" issued by the same company sets forth in detail the superior qualities of its new double cable-base tire construction. It is pointed out that the most serious forms of tire trouble are: side-wall breaks, rim cuts, blowing off of the rim, and tube pinching, and that the tire with a hard-bead filler is conducive to these defects. The new Federal tire has incorporated in each bead two endless, five-wire cables of great tensile strength. These cables serve to anchor the heel and toe of each bead securely to the rim. Surrounding the cables is a flexible bead filler imbedded in soft rubber, forming a support for the tire side walls where they bend to meet the side rings. The folder illustrates and describes in detail the construction of this tire.

CIRCULAR ON CHEMICALS FROM E. DE HAEN.

We are in receipt of the latest folder and price list of E. de Haën, the well-known concern of Seelze, near Hanover, Germany, which for a great many years has made a specialty of the manufacture of chemicals for the rubber trade. Copies of this list, and of catalog, may be obtained by application to Messrs. Pfaltz & Bauer, New York agents, at 300 Pearl street.

BRISTOL'S RECORDING INSTRUMENTS.

In these days of efficiency it is more than ever necessary to record facts and figures with accuracy. The remarkable completeness of the "Bristol" line in this respect makes it of interest to every well organized factory.

A set of current catalogs has been issued by this enterprising house in a binder, presentation and reference being thus facilitated.

The catalog of recording gauges for pressure and vacuum is followed by separate bulletins dealing with recording water-level gauges. Next in order come the lists of differential pressure gauges. Perhaps the section that will prove of most general interest is that which describes recording thermometers, which occupies a large share of the binder and illustrates thermometers for all purposes. A special catalog deals with the W. H. Bristol electric pyrometers.

Electric recording instruments form an important part of the catalog, while other sections include time, motion, speed, flow and humidity.

It requires an examination of the Bristol general catalog to

appreciate the many uses of recording instruments. The extent of the field covered by the company may be understood from the fact that a partial list of firms using Bristol gauges includes over 2,000 leading concerns in the United States. This standard line is made by The Bristol Co., Waterbury, Connecticut.

IF A TIRE COULD SPEAK.

The Hood Rubber Co., of Watertown, Massachusetts, has just issued a little brochure entitled "If a Tire Could Speak," which gives in entertaining form the autobiography of an automobile tire. This particular tire, because of its attractive appearance, was put by the dealer in his show window, where it stood day after day in the blazing sun. Fortunately, however, this experience was a short one, as a motorist who had had a disastrous experience with a skidding tire pulled up in front of the dealer's store and demanded this particular window tire. It was put on his machine, and it relates in its own way its further experiences. The book is quickly read, is humorously illustrated and gives the user of tires some excellent advice.

ON THE CARE OF AUTOMOBILE BRAKES.

An interesting booklet, recently published by the H. W. Johns-Manville Co. of New York, contains much valuable information on the construction and care of automobile brake linings. This booklet also describes the new J-M electric lamp, the body of which is made entirely of hard rubber; the J-M radiator shield, fire extinguishers, valve packing and a large number of other asbestos products.

A TYPICAL ENGLISH RUBBER CO.

In an artistically illustrated catalog recently issued, the India Rubber, Gutta Percha & Telegraph Works Co., Ltd., Silvertown, London, has told the story of its varied production.

First is shown the power-plant, with a 700 k. w. generating set, followed by a motor-driven rubber-washing machine, a direct-driven rubber warmer as well as mixing and calendering machinery. These first processes deal with the rubber in an unfinished state, while, for the rubber-covered or impregnated fabrics there are the "Waterproof," "Belting," "Tire," "Hose" and "General Mechanical" departments.

An interesting specialty of this company is the "Palmer Cord Motor Tire." The fundamental difference between this and all other motor tires is that instead of four, five, or more layers of canvas, the foundation consists of only two layers of cotton cord, impregnated and coated with the finest rubber. The illustrations comprise: The high-pressure solutioning apparatus for expelling air from between the fibres of the threads in the cords; tire shop and cord laying machines; tire molding shop; tire vulcanizing plant, and other features of the tire department.

Ebonite is another specialty of the company's make, in which, as the catalog recalls, the prolongation of the vulcanizing process causes the use of a greater proportion of sulphur than is the case with soft rubber goods. Surgical appliances, testing instruments and an infinite number of other articles are made of ebonite. Adhering well to metals, it finds a useful sphere for mechanical purposes.

GUTTA PERCHA DEPARTMENT.

Gutta percha has always taken a prominent part in the manufactures of the company, and the processes for its treatment are described in the catalog. On their arrival at Silvertown the blocks are first softened in warm water tanks and are washed for the removal of the grosser impurities. They are then worked up in masticators and the remaining impurities eliminated by means of fine sieves, through which the material is forced at a pressure exceeding 100 tons. The mass is then passed through cylinders, which roll it into sheets of any desired width and thickness, being then ready for application to any form of manufacture.

While the extent of its application is secondary to that of rubber, there are many cases in which it cannot be replaced by any other known material. Among its chief uses is the core of submarine cables, for which purpose it is generally employed in preference to India rubber as the insulating material. This is due to the greater facility of application to conductors arising from its plasticity. Moreover, faults or imperfections can be more easily localized during manufacture or in service. A considerable portion of the Silvertown works is devoted to the manufacture and maintenance of this gutta percha core.

Other important applications of gutta percha are the manufacture of bosses for cotton spinning machinery, acid test bottles and tubes for use in breweries, for hospital purposes and in dentistry.

GROUP OF ARTICLES MADE OF GUTTA PERCHA.

Golf balls form one of the best known applications of gutta percha, in which manufacture a considerable change has occurred of late years, solid balls having been replaced by those with cores of rubber thread. The catalog finally deals with the electrical department, the various machines being effectively illustrated.

GOODRICH CONVEYOR BELTS.

The B. F. Goodrich Co. of Akron, Ohio, has issued a small eight-page folder, attractively printed in three colors, descriptive of three conveyor belts which the company is now marketing. They are the "Long Life," "Grainbelt" and "Maxecon."

The "Longlife" is adapted to general service involving hard usage likely to wear out an ordinary quality; while the "Grainbelt" is particularly intended for grain. Having no extra thickness of cover, it cannot, however, be used where there is much surface abrasion. For the higher class of service, where the belt is not run continuously, the "Maxecon" is a reliable and economical grade. At the same time, it is not recommended for hard wear as a cheap substitute for the "Longlife."

Goodrich conveyor belts, it is claimed by the makers, carry more tons per dollar than any other quality, this being the only correct standard for comparing different installations. Such a degree of excellence is only obtainable through careful selection of material and attention to the necessary thickness of cover.

With the attractive title, "The Reason Why," a separate catalog deals with the answer so far as regards the "Longlife" belt.

AN ENGLISH TIRE CATALOG.

A very complete catalog on tires has been recently sent us by The Shrewsbury & Challiner Tire Co., of Manchester, England. This booklet gives a large number of illustrations of "Giant" and "World" endless band, solid rubber tires in their actual sizes, which allows the construction of the tires and their manner of fastening to the rims to be shown to good advantage. A page is devoted to illustrations and an explanation of the proper method of testing for alignment of wheels. This is an important subject, since poor alignment, caused by bent axles or steering arms, is responsible for much undue wear in both solid and pneumatic tires.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

MOTOR TYRE NOTES.

THE Clark Tyre Co., Ltd., has leased some large mills at Crayford in Kent and expects to be turning out tires before long. The patents deal with the method of building up the rubber and canvas of the pneumatic tire and are the outcome of long experimenting by Mr. Clark in Australia, where he has been for seven or eight years. The new company is well backed, its capital, I understand, being in the neighborhood of £150,000. The contract for machinery has been placed with Messrs. Eddon of Leyland.

The Prowodnik motor tire, which is characterized by its peculiar brownish color, appears to be very popular and to be selling well against its rivals, despite the fact that the covers cost about £2 more than those of well known makes longer established.

On October 16, Mr. George Sutton, manager of the W. T. Henley's Telegraph Works Co., Ltd., showed a large party of motorists and dealers over the new tire factory just opened at the company's Gravesend branch.

Judging by the demand in Paris for the Macintosh tire, this make seems to have firmly established itself in France.

I hear that the Stelastic tire is coming on well in public estimation. It is owned by the limited company of this name which was floated about a year ago. The steel in this tire is in the form of springs embedded in the rubber, thus differing from the Wood-Milne tire in which fine steel dust is mixed with the rubber. The business done in motorcycle tires has largely increased of late owing to the growing popularity of these machines. These tires are made in varying qualities, the wear being generally in a direct ratio with the price. Prices at retail vary from 14s. to 52s. each, the latter figure being that at which the well-known Kempshall tire is sold.

The Dook-Swain Tyre Co., of Manchester, is to be wound up voluntarily, a resolution to that effect having been passed at a meeting of the shareholders. Mr. Leo Swain, the prominent tire and motor accessory agent of Manchester, severed his connection with the company many years ago.

ASBESTOS.

The lamentable railway disaster at Aisgill in September last brought the matter of fireproof railway coaches under general discussion. According to numerous press reports a prominent railway official declared that asbestos was unsuitable for constructional work because it attacked nails, metal fittings, etc., and there was also a doubt as to how long its fire-resisting properties would last. Mr. J. A. Fisher, however, wrote to the press pointing out that the statements in the papers were not correct, as it was fireproofed wood and not asbestos that they referred to. A good many people were naturally surprised when they read of the supposed defects of asbestos and Mr. Fisher's letter was decidedly appropriate, in the interests of an important industry.

Asbestos millboard is already largely used in the construction of coaches on the underground electric railways in London, and quite recently the Midland Railway has commenced experimenting with fireproof coaches in which asbestos is used. Of course there will be competition among the makers of asbestos goods for the new demand which is foreshadowed, and it may be that pure asbestos fibre will not hold the field.

A substance called uralite is already being largely used for fireproof buildings. This is understood to consist of asbestos fibre cemented by a mineral glue consisting of gelatinous silica and a little chalk, the whole being consolidated under heat and pressure. Asbestos slates are being increasingly used, a prominent instance being at the new Partington steel works near Manchester. This industry I mentioned some months ago was being taken up by Messrs. Turner Bros., Ltd., at their new works at Trafford Park, Manchester, and they have recently taken more adjoining land with a view to future developments. A modern use of asbestos is in connection with the acetylene gas industry. In order to make a non-explosive transportable gas the Acetylene Illuminating Co. uses light steel cylinders filled with baked asbestos, the pores of which are charged with acetone. The cylinders are then charged with acetylene under pressure, and on opening the valve the gas is given off steadily. Such cylinders are chiefly used for lighting motor vehicles.

MILK PRODUCTS.

The last few years have seen great strides in the industrial applications of milk, apart from the development of the manufacture of foodstuffs such as dried milk in South America. One sometimes hears casein products referred to as rubber substitutes, but, tho they may have entered in small quantity into certain rubber mixings, I feel sure that the rubber planter has little to fear in this direction. It is the camphor producer whose business is threatened, as by far the greater amount of the commercial articles made from casein enter into competition with those made from celluloid, an important desideratum being their non-inflammability. Up to quite recently only one of these casein bodies has had any real commercial success. This is galalith, made on the Continent of Europe; but this has now found a competitor in lyrolit, which is being manufactured at Stroud, in England, and which is reported to be in demand in trade circles where celluloid, xylonite, etc., have hitherto been used. It is also said to be a good electrical insulating material and to be able to replace vulcanite. Here, of course, it comes into competition with rubber.

I think, however, that in the state of public feeling against the dangers of celluloid, the non-inflammable milk products will find their best markets in the case of goods for household and personal use. For instance, they have proved quite satisfactory for buttons; and there has been quite an outcry lately about inflammable celluloid buttons. Lyrolit may possibly not have the defects which have characterized its predecessors, prominent among which are liability to absorb water and swell up, and the fact that, unlike celluloid, thin films of the material cannot be obtained. Galalith is manufactured in France by the Compagnie Internationale de la Galalithe Hoff et Cie, at Levallois-Perret, and in Germany by the well-known United Harburg-Vienna Co., at Harburg. These milk products are of quite different constitution to the other principal substitute for celluloid, viz., bakelite, a condensation product of phenol and formaldehyde. This body, which originated in America, is now being made in Europe.

THE LIVERPOOL FACTORIES.

The Liverpool Electric Cable Co., which used to be located in Vauxhall Road, next to the Liverpool Rubber Co., is now established at Linacre Lane, Bootle, a suburb of Liverpool. This company has no connection with the New Liverpool Rubber Co., of 292 Vauxhall Road. This latter company, it will be remembered, was so named when the concern formerly called the Liverpool Rubber Co. was taken over, a few years ago, by Messrs. C. Macintosh & Co., Ltd. The works manager is Mr. M. Davis. Some little distance away, at Walton, the New Liverpool Co.

has a branch works entirely devoted to the rubber shoe business. This is managed by Mr. Frederick H. H. Smith, eldest son of Sir F. H. Smith, Bart., who is chairman of Messrs. Macintosh & Co., Ltd. Mr. Ivor W. Davies is the works manager.

MR. HERBERT STANDRING.

Mr. Herbert Standring has somewhat startled his numerous friends in the rubber trade by the announcement that he has resigned his position and all connection with the "India Rubber Journal" in order to embark on a new venture. Mr. Standring has been associated with our contemporary since its birth in 1884. At that time he was connected with the production of other trade journals and happily hit upon the rubber trade as offering good scope for further journalistic enterprise. For many years he retained the editorship, relinquishing this when the paper was taken over by Messrs. Maclaren. I know nothing of the details of the new work to which he has set his hand but have no doubt that he will bring to it all that industry and enthusiasm which has characterized his connection with rubber journalism in the past.

MESSRS. J. E. HOPKINSON & CO., LTD.

This firm, whose works are situated in rural surroundings at West Drayton, Middlesex, has recently found it necessary to call its creditors together, and the upshot of the conferences that have been held is that, with the assistance of some of the principal creditors, a new company is to be formed. The matter has not exactly gone through yet but it is fully expected to do so by the first of January, the date fixed. The name of the new company is to be the Caxton Rubber Manufacturing Co., the capital being £10,000. Mr. Hopkinson, with whose financial predicament there is general sympathy, explains that the present situation has been brought about by the falling through of a scheme whereby his works were to have been purchased by a certain firm and a large company formed to manufacture goods from murac, a body which was more extensively advertised some years ago than it is at present. The Murac works are at Edmonton, near London, but I understand that business is practically at a standstill owing to an injunction against them by the local authority for causing a nuisance.

BALATA IN FOOTWEAR.

A compound consisting largely of balata is being increasingly used by Messrs. R. & J. Dick, of Glasgow. In leather boots the soles are made of this material, which is said to have advantages over leather mainly because it is absolutely impervious to water. Such soles cost about the same as leather but have three times its life. Tennis shoes for grass or asphalt courts are now made with balata soles on a thin leather basis, these soles being also used instead of leather for sand shoes.

FRENCH MANUFACTURERS TO EXHIBIT IN LONDON.

The Syndical Chamber of Rubber Manufacturers, Paris, of which Monsieur G. Lamy-Torrilhon is the president, met recently and unanimously decided to give the Fourth International Rubber and Allied Industries Exhibition to be held in London next June their official recognition. This now completes the list of important associations in all parts of the world connected with the rubber industry, producing and manufacturing, which have accorded the coming exhibition their recognition. The list includes the following associations: The Rubber Manufacturers' Associations of France, Germany, Austria, and Belgium; the Rubber Club of America; the Rubber Growers' Association of London; the Planters' Associations of Ceylon, Indo-China, Belgium, British Malaya, Malacca, Johore, Southern India, and Java; the Rubber Association of Holland (Amsterdam); the Commercial Associations of Pará, the Amazonas, the Republic of Peru, and other producing countries. Every important producing country will be officially represented.

MR. EATON'S REPORT ON EUROPEAN FACTORIES.

IN the report of his visits to different European rubber factories and testing stations, Mr. B. J. Eaton, of the Agricultural Department of the Federated Malay States, has pointed out several facts of interest. He refers in the first place to the complaints (which he considers justified) of the unclean condition in which plantation rubber is often received in Europe, containing pieces of wood, splinters, sand, and other impurities. This fact necessitates thorough washing, imposing more work on the manufacturer and frequently affecting the quality of the rubber, the methods of cleaning used in the East having in many cases not proved satisfactory.

Mr. Eaton recalls the fact that previous to vulcanization the rubber is cut fine and placed in large tanks of cold water. It is then worked by means of a "Hollander," in which the heavier foreign substances such as sand sink to the bottom, while the lighter impurities such as bark and splinters rise to the surface. The rubber is then removed by means of forks; this method seeming to be more efficacious than the process of direct washing in the crêping machines. Mr. Eaton expresses himself in favor of the machine in which the washing and further operations are conducted under water.

Any one acquainted with the later processes of rubber manufacture will understand the importance of preliminary cleaning, every particle of undesirable substance left in the rubber producing a weak spot in the subsequent vulcanized product. Such weak places when subjected to mechanical strain naturally give way.

There is no uniformity between the width of the rollers of the washing and crêping machines and the dimensions of the packing cases. The employment of rollers of interchangeable diameter is recommended for the production of rubber in any desired uniform width.

With regard to coagulation, Mr. Eaton does not approve the present system, but recommends the latex being allowed to flow into long troughs, divided by partitions.

[Details of these new coagulating tanks were published in the October issue of the INDIA RUBBER WORLD, p. 44.]

A point on which manufacturers complain of plantation rubber is the lack of uniformity in quality. It appears impossible to get a quality equal in uniformity to the standard of Fine Hard Pará. Even in the good qualities there is much variation. This fact is attributed to the diversity in methods of coagulation, each plantation using a system of its own.

Mr. Eaton remarks that too little attention is paid to the color of rubber by manufacturers, who in general consider that it forms no criterion of the value. Hence rubbers of various colors are treated at the same time. He adds that makers of "dipped goods," calling for translucency, require for that purpose the lighter shades of rubber.

According to Mr. Eaton's experience, there is in Europe a diversity of opinion as to the drying of rubber, the vacuum dryer being generally used where quickness is desired, while drying chambers are usually employed under other circumstances. The temperature of the vacuum dryers he found to vary from 140 to 160 degrees Fahrenheit, some qualities being dried at a higher and others at a lower degree of heat. Certain fine grades, such as Fine Hard Pará, can be dried without injury at a very high temperature.

The preparatory operations to which rubber has been subjected are of considerable moment in connection with its subsequent treatment. Plantation rubber of the highest grade undergoes no preliminary washing, but is hung out in order to permit the evaporation of the moisture it may have absorbed in transit. This grade is seldom met with. All other qualities of plantation rubber are washed as far as possible at one time, to insure uniformity of product.

With Fine Hard Pará and other grades packed in like manner,

the bales are cut open and the contents soaked in boiling or warm water until the rubber is soft enough for further treatment. In conclusion it is stated that plantation rubber loses in washing from 1 to 2 per cent., while the loss varies in other classes of rubber.

Such are the principal features of Mr. Eaton's report on his visit to Europe as reproduced by the "Indische Mercuur."

GREAT BRITAIN'S RUBBER GOODS TRADE.

The total commerce of Great Brtiain in rubber manufactures for the year 1912, as shown in the following table, amounted in value to $17,661,437.

	Imports.	Exports.	Re-exports.
Boots and shoes of rubber, or of which the component material of chief value is rubber.	$638,722	$651,141	$75,121
Waterproofed wearing apparel, including that waterproofed by processes other than coating with rubber.....	40,270	3,958,053	8,171
Other manufactures of rubber, except tires and tubes for carriages	3,370,431	8,427,852	491,677
Total	$4,049,423	$13,037,046	$574,969

Of the boot and shoe imports, 56,822 dozen pairs, valued at $398,629 were supplied by the United States, 37,722 dozen pairs, worth $184,513, being furnished by Germany. In general rubber goods, Belgium was the chief source of supply, the imports from that country amounting to $2,288,506, Germany and the United States supplying respectively $1,532,325 and $1,103,493 worth.

Statistics for 1912 included rubber tires and tubes with motor cars, motor cycles, etc., and their parts, but during 1913 these figures have been separately recorded, and for the six months ending July 31 a commerce of $8,157,705 is shown in this branch of the rubber industry, being divided as follows: Imports, $3,578,335; exports, $3,852,510; re-exports, $726,860.

NEW USE FOR RUBBER ON MOTOR VEHICLES.

On one of the later models of a prominent English motor truck is seen a new use of rubber. Surrounding the propeller shaft is a capacious thrust tube, which absorbs the forward thrust from the rear axle by means of a cast-steel cross member at the forward end of the tube. The ends of this cross member are mounted in special brackets attached to the side frame members of the chassis, each bracket containing a round rubber seating block, into which the ends of the cross members fit. This method of design is adopted in order to insure flexibility of this part with reference to the final drive.

ODORLESS RUBBER SPONGES.

While various opinions adverse to rubber sponges have been ventilated in the German press and have been disputed, the merits of the article have been prominently urged by several of the leading manufacturers. This has in one case taken the form of showing that the report as to their having an unpleasant odor can only refer to inferior grades, high class qualities, made from a good grade of rubber, being exempt from that defect. Other makers have been urging the fact of their not injuring the tenderest skin.

"HOPP-HOPP."

"Hopp-Hopp" is the name of a new toy rubber ball brought out in Germany, its name indicating its lightness and elasticity. It can be allowed upon fragile articles without doing any damage, is very transparent and of effective appearance.

OLYMPIA MOTOR SHOW.

The promoters of the recent motor show at "Olympia," London, claim that it formed the most typical collection of motor cars ever assembled under one roof. It lasted from November 7 to November 11, and from its opening day the attendance and the business transacted seem to have borne out the above contention.

Among the most attractive exhibits were those of the Rolls-Boyce, Daimler, Metallurgique, Sunbeam, Darracq, Fiat, Humber, Cadillac, Clement-Talbot, and other concerns. The value of the show as a means of attracting business is admitted by manufacturers, even pessimists allowing that the interest displayed has been greater than they had anticipated. "Olympia" may thus be regarded as one of the really important social and industrial features of the immediate future with respect to the auto industry.

An inspection of the "Olympia" exhibit is said to have shown that a large majority of the cars were fitted with "Dunlop" tires. The exhibit of the Dunlop Rubber Co. itself included the new twin detachable wheel for carrying double rear tires on heavy cars, The Michelin company made a fine exhibit of tires and accessories. The Continental Tire & Rubber Co. gave a representative display of specialties.

FOREIGN TRADE NOTES.

The exports of balata from Venezuela in 1912 amounted to 9,129,657 bolivars ($1,762,023.80), being divided between Germany, France, the United States, and Great Britain in the following proportions: Germany, 3,331,606 bolivars ($642,999.95); France, 3,122,631 bolivars ($602,667.78); United States, 1,498,169 bolivars ($289,146.61); Great Britain, 1,177,251 bolivars ($227,209.44).

American manufacturers have been for some time making rubber-soled outing shoes with small toe-caps of rubber, but the samples lately put out by a Canadian company, The Kaufman Rubber Co., Limited, of Vancouver, show a cap of white rubber about the size of an ordinary toe-cap, the idea being to prevent the soiling of the canvas upper in addition to saving the foot from dampness.

The Continental Tire & Rubber Co., of London, England, has recently established a plant at Mazagon, Bombay, for the reconstruction of old tires. This plant comprises a factory, well equipped for this purpose, power house, etc. The fact that the freight on tires from Bombay to Calcutta by either rail or steamer amounts to quite an item makes it seem probable that this company will confine itself to reconstruction work and that there may still be room for the native Indian tire manufacturing plant at Calcutta proposed some little time ago, but whose organization has not yet been completed.

A College of Agriculture, costing $150,000, is to be built in Rhodesia by the British South Africa Co.

The value of raw and waste rubber imported into Russia during 1913 amounted to $11,264,000, a gain of $2,685,500 over the imports of similar goods in 1912. The exports of that country to the United States in rubber waste dropped from $21,862 in 1912 to $10,314 in 1913.

At the exposition to be held in Dusseldorf, Germany, in 1915, for the purpose of depicting what human ingenuity and endeavor have accomplished in the last century in the branches of commerce, trade, science, industry, and art, a section will be devoted to the progress in chemistry—general, special, synthetic, analytic, and applied.

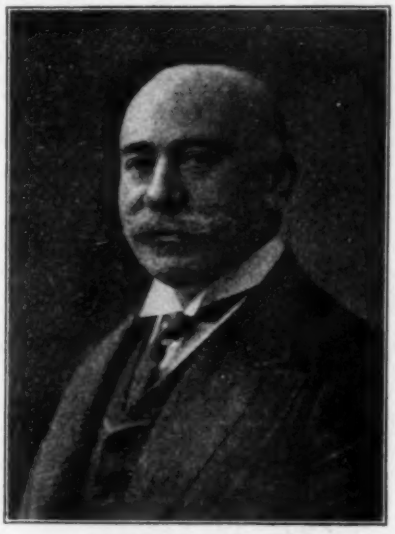
THE FRENCH AUTOMOBILE SHOW.

Well in advance of its rival displays in other countries, the French Automobile Show was held in Paris from October 17 to 27. An article dealing with this show, so far as it affects rubber, will appear in the issue of January.

SIEGMUND SELIGMANN.

A remarkable anniversary has lately been celebrated in Germany. Siegmund Seligmann, a pioneer of the German rubber industry, attained his sixtieth year on August 19 last. Being at the head of the Continental Caoutchouc und Guttapercha Co., of Hanover, his name is familiar to the rubber trade in general, but in view of the recent celebration it may be appropriate to recall some personal details of his career.

Born on August 19, 1853, at Verden (Aller), he passed through the Royal Cathedral Gymnasium at Verden, later on studying privately at Harburg (Elbe). His commercial training



SIEGMUND SELIGMANN.

was received in the Hanover banking house of B. Magnus, the proprietors of which were co-founders of the Continental Co.

On April 7, 1876, Herr Seligmann was appointed to a confidential position in the Continental Co. for the purpose of a reorganization. In the year 1875 the company's situation was so menaced that Herr Jacob Frank, the director, submitted an alternative proposition of suspending payments or obtaining new credits. Hence the intervention of Herr Seligmann became necessary. In the capacity of cashier of Messrs. Magnus, he made a thorough investigation of the company's position, as a result of which new credits were accorded by the bank. This re-organization was due to his energy, ability and caution, showing what young Seligmann was made of, and his eligibility for future higher responsibility. On April 7, 1876, his services were transferred to the company for which he held a power of attorney from October 12 of the same year, becoming a member of the board on July 17, 1879, which position he still fills. For the term of thirty-seven years he has thus held various posts of increasing responsibility, culminating in the direction of the company's operations.

With the entrance of Herr Seligmann and of the late chemist, Dr. Prinzhorn, the upbuilding of the company began, the foundation being laid for its ultimate important position in the world's rubber industry.

In 1905 Herr Seligmann received the distinction of "kommerzienrat," or "Commercial Councillor," while in various other capacities he has acquired a high reputation. He is a member of the Hanover Chamber of Commerce, of the board of the Central Association of German Rubber Goods Manufacturers, and a member of the board of the German Exhibition Commission.

THE INDIA RUBBER WORLD adds its own to the many expressions of personal regard for Herr Seligmann on the part of European rubber contemporaries.

GERMAN OPINION RESPECTING THE FUTURE OF RUBBER.

IN commenting upon the position and prospects of rubber, various German authorities have called attention to the absence of the Stock Exchange operations and reckless establishment of plantations which led to the depression succeeding the boom of 1910. Supply and demand are now the regulating factors, governed in their turn by the available stocks and the wants of dealers and manufacturers.

One of the explanations adduced for the disproportionate fall since May, 1911, of about 50 per cent. in Fine Pará and of nearly 70 per cent. in plantation, is the different manner in which the offerings are made. Wild rubber is concentrated in the hands of relatively few concerns, while every plantation company has a representation in England, altho in some cases grouped with others for the sake of economy and convenience. Plantation rubber is widely distributed among the London houses on consignment and is thus at the mercy of buyers.

One prominent German rubber merchant attributes the lack of uniform quality to the fact that with so many plantations and an equal number of managers, differences in preparations are unavoidable; uniformity in large quantity not being possible, as in the case of Fine Hard Pará. Large buyers are said to recognize the fact that all qualities of latex from known trees are in themselves good, and that the production of a better or an inferior rubber depends upon the mode in which the latex is treated.

In the matter of future supply, the question of the possible overthrow of wild rubber in favor of plantation rubber and the latter controlling the market is generally regarded as unworthy of serious consideration. "Long before a rubber tree was planted in Asia," it is remarked, "the forest used to send us rubber at prices near the present limit."

Regarding the statistical position, the fact of production and consumption for 1912 having maintained an even balance of about 100,000 tons is adduced in proof of the assertion that there is at present no visible overproduction. Starting from this point of 100,000 tons consumption for 1912 and adding an estimated annual increase of 15 per cent., the anticipated quantity for 1919 would be 265,900 tons, against the Akers estimated production for the same period of 302,450 tons.

In relation to plantation rubber, two proposals have been ventilated which have attracted much attention in Germany: The Central Selling Agency in London, and the project of selling rubber in the countries of origin. Both these plans have been commented upon with favor.

COMPARATIVE EXPORTS OF RUBBER GOODS TO BRAZIL FROM GERMANY AND THE UNITED STATES.

A comparison of statistics shows between 1907 and 1911 German exports of rubber goods to Brazil increased by about 38 per cent., while the augmentation in United States exports to that country beween 1907 and 1912 equalled abou 265 per cent. The figures are as follows:

EXPORTS OF RUBBER GOODS TO BRAZIL.

	From Germany.	From United States.
1907.....	$206,000	$56,012
1908.....	156,750	59,867
1909.....	170,500	84,462
1910.....	254,500	105,145
1911.....	278,750	150,465
1912.....	.....	199,239

HARD RUBBER PROPELLERS FOR AIRSHIPS.

Advices from Germany state that renewed attention is being given to the possibility of using hard rubber propellers for airships in place of cherry, walnut and pear, those woods having been most generally employed for that purpose. A wooden propeller costs from $400 to $500.

Some Rubber Planting Notes.

FEDERATED MALAY STATES—RUBBER OUTPUT.

ACCORDING to information cabled by the Federated Malay States Government, to the Malay States Information Agency, the exports of plantation rubber from the Federated Malay States for the month of October amounted to 4,838,400 lbs. as compared with 4,480,000 lbs. in September, making the total for the ten months of the present year 42,078,689 lbs. as compared with 27,917,013 lbs. for the corresponding period last year.

Appended are the comparative statistics for 1911 and 1912:

	1911	1912	1913
January	1,329,170	2,730,576	4,772,880
February	1,490,849	2,715,767	3,936,529
March	1,916,219	3,089,583	3,890,880
April	1,235,917	2,285,390	3,642,240
May	1,147,488	2,255,034	2,744,000
June	1,229,754	2,305,915	4,491,200
July	1,581,993	2,695,861	3,989,440
August	1,651,845	3,655,535	5,293,120
September	1,677,062	2,968,121	4,480,000
October	2,182,857	3,215,231	4,838,400
Total	15,443,154	27,917,013	42,078,689

RUBBER EXPORTS FROM THE FEDERATED MALAY STATES.

Shipments of cultivated rubber from the Federated Malay States for the first eight months of 1913 amounted to $14,627.74, a gain of $6,557.15 over shipments for the first eight months of 1912. The following comparative table shows the destination of these shipments:

To—	1912. Tons.	1913. Tons.
Straits Settlements	3,284.50	6,395.11
United Kingdom	3,981.25	6,905.07
Continent of Europe	574.34	920.81
Ceylon	220.42	406.75
Other countries	10.08	.....
Total	8,070.59	14,627.74

FEDERATED MALAY STATES RUBBER CO.

Notwithstanding its English title, the financial organization of this company is Belgian, its headquarters being at Antwerp. At the time of its establishment in 1905, its object was the planting of coffee in the Malay peninsula, but later on the high prices of rubber and the boom in that article induced the directors to abandon the former cultivation and to replace it by that of the latter.

Its capital equals $820,000. Its dividends have been: 1906, 8 per cent.; 1908, 9.24 per cent.; 1911, 2.90 per cent. The yields were: 1906-7, 32,000 pounds, and 1911-12, 721,000 pounds, while the estimate for 1912-13 exceeds 1,000,000 pounds, this development being attributed to the importations through Belgium for account of French consumers.

UMBRELLAS FOR RUBBER TREES.

The efforts of inventors to discover new uses for rubber are eclipsed by the innovations offered to its producers. Among patent specifications recorded in the "Ceylon Observer" of recent date, may be mentioned an umbrella shaped shield, affixed to the trunk of a tree at a convenient height, in such a manner as to shed water that might flow down the stem and interfere with the tapping operation, combined with a curtain to complete the protection. Another inventor proposes to deprive the air circulated in rubber drying chambers of its moisture, by causing it to pass through a spray of chloride of calcium or other suitable hydroscopic solution, so that the air will enter the drying chamber as free as possible from moisture.

CEYLON'S PROPOSED EXPORT TAX ON RUBBER.

A resolution has been proposed in the Ceylon Government Council to establish an export tax on rubber of 0.75 rupee (24 cents) per 100 pounds. This proposed duty has met with local opposition, rubber merchants claiming that if in addition to the export duty paid on most of the rubber shipped into Ceylon from the Federated Malay States, India, etc., an extra charge of 24 cents per 100 pounds should be imposed upon rubber reshipped from the island, it will be very likely to go elsewhere. It is also stated that the enforcement of this tax would impose a hardship on the rubber exporters, who have already contracted for 1914 future sales without having taken into consideration any added export duties.

CASTILLOA PRODUCTION IN JAVA.

Among the papers to be read at the 1914 Rubber Congress at Batavia, is one contributed by the Central Java Testing Station at Salatiga, on the cultivation of the *Castilloa* tree in Java.

COMPAGNIE DU KASAI GIVING UP RUBBER!

A report in the Belgian press states that the above company is giving up the rubber business to devote its attention to mining and agriculture. Its surplus is said to have at one time equaled $2,600,000.

NEW RUBBER SECTIONS AT AMSTERDAM DOCKS.

Two new sections are being constructed at the Amsterdam Docks for the accommodation of the rubber trade, at a cost equaling $18,000. It is in contemplation in this way to increase the facilities for inspecting rubber at the above-named port.

BUDGET OF NETHERLANDS INDIA.

A legislative measure is before the Dutch Second Chamber which devotes a sum equalling $360,000 to the reorganization of the official staff at the principal points in the Dutch Indies. The realization of the project is expected to take four years.

NEW SCALE OF CONGO RUBBER EXPORT DUTIES.

The following new scale of export duties on rubber has been published in the "Official Journal of the Belgian Congo" (denominations converted into American equivalents):

From grasses—

Not exceeding 27 cents per pound.....Free
Over 27 cents per pound.....2¼ cents per pound

Free or vine rubbers—

Not exceeding 45 cents per pound.....2¼ cents per pound
45 to 63c. per pound.....2¼ cents per pound
63 to 72c. per pound.....4½ cents per pound
72 to $1.08 per pound....9 cents per pound
Over $1.08 per pound.....11½ cents per pound

Plantation rubber .....Free

These rates (which are to be revised quarterly) are intended to place the Congo export duties in harmony with the present selling prices of rubber.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

RUBBER NOTES FROM BRITISH GUIANA.

By Our Regular Correspondent.

A NOTEWORTHY feature in connection with the progress of the rubber plantations in this colony is the fact that a few Ceara rubber trees (*Manihot Glaziovii*) have now arrived at a tappable age and size. A writer in the "Chronicle" refers to this fact and points out that Mr. R. N. Lyne, now Director of Agriculture in Ceylon, who was formerly Director of Agriculture in Mozambique and Zanzibar, in the course of a recent report, deals with the correct method of obtaining latex from the *Manihot* tree; which, of course, differs essentially from the manner adopted in the case of Pará trees. He says:

"The principle of stabbing or pricking is now generally accepted as the most successful system for the East Coast of Africa, but it is important that this system should be applied in the right manner. The stabs should be made with the flat of the knife held horizontally, not vertically . . . and they should be made close together. The trunk of the tree may be divided for the purpose of tapping into two or three parts, vertically, each part being sub-divided laterally into three or four sections according to the girth of the tree. . . . Tappings may follow one another for three or four days, and then an interval of a fortnight or twenty days allowed to intervene. This may continue for as long as the tree is in leaf, which may be, perhaps, nine months out of twelve. A 3 per cent. solution of acetic acid brushed on the trunk of the tree before tapping may be used as a coagulating mixture, but carbolic acid, which makes the rubber harder, is now being used in German East Africa either by itself or mixed with acetic acid."

PROGRESS IN TRINIDAD.

The world of rubber, as a rule, devotes but little attention to those countries where rubber growing is only in the experimental stages. In these days the struggle for supremacy between Brazil and the East claims the general attention. It is interesting, however, to note what is being done in our neighboring colony of Trinidad, where a little progress is being made. The extent of that progress is described fully in a report just issued by Mr. A. E. Collens, Assistant Government Analyst and Officer in Charge of the special experiments. This report informs us that rubber plants were introduced into Trinidad as far back as 1876. In that year, two *Hevea Brasiliensis* plants were received from Kew Gardens, London, and planted in the local Botanic Gardens. Records published four years later refer to them as being over twenty feet high. In 1878, *Hevea Guyanensis* was introduced, and in 1880, *Hevea pauciflora, Castilloa elastica,* and a number of *Landolphia* plants.

A couple of *Hevea* trees then planted are now over eighty feet in height, their yield is comparatively high, and the latex is of good quality. Other varieties than those mentioned were introduced at later periods, but only the *Hevea* plants have thriven.

As regards the latest experiments, we have it from the report that last year experimental work was conducted on twenty-five trees, which are said to be growing on extremely poor soil, in districts where the average annual rainfall is about sixty inches.

"Some of these trees," Mr. Collens says, "are more advanced and larger in girth than the rest, and it is possible that the smaller ones may be supplies put in to replace others. The trees at St. Clair were originally interplanted among *Castilloa* rubber, but soon outstripped it, and the *Castilloa* trees were accordingly cut down. Situated among these trees are some which bear distinctive features. . . . Their salient differences are: bark, coppery or rust colored, instead of gray; bark, thin and usually only slightly over a quarter inch in thickness, in some cases much less; latex, creamy yellow; rubber, slightly sticky and inferior in elasticity; leaves, semi-transparent, with reticulated or criss-cross veins, especially noticeable when the sunlight is passing through the leaves; seeds, larger than those of *Hevea Brasiliensis,* round-angled grayish blotched, and somewhat elastic or yielding when pressed. . . . General characters of tree: tall, good growth, umbrageous, fairly dense foliage."

The report further states that eight additional trees, of a similar type to the above, when tapped, yielded in two months, 47.4 ounces of dry rubber, being an average of 5.9 ounces, approximately. A trial shipment of what is described as "inferior rubber" was recently made and realized $1.02 per pound, when Fine Pará was selling at $1.08 and upward.

"The biscuits," continues the report, "were prepared by coagulation with a dilute solution of sulphuric acid, and at the International Rubber Exhibition in New York last year were reported on as follows: 'Fine, well-prepared, smoked *Hevea* biscuits in excellent condition. These biscuits show little room for improvement.'

"Specimens of blocked sheets, prepared by immediate coagulation either by pyroligneous, acetic or sulphuric acids, were reported on by the examiners appointed for the West Indian exhibits as follows: 'Good tough *Hevea* sheets, apparently excellent quality, some paler than others.' The biscuits prepared by slow coagulation with sulphuric acid were stated to be: 'Fine smoked *Hevea* biscuits, good color and thickness and in excellent condition . . . about the best *Hevea* on the Stand.' For those made with lime juice, pyroligneous acid and sulphuric acid, without smoking, the report was: 'Fair average quality, unsmoked *Hevea* biscuits.'"

According to the tone of the report as a whole, we find a record of good qualities of rubber, but small yields.

BALATA.

The balata season may now be said to be practically over, and it is extremely doubtful whether we shall see many more balata seasons. As compared with last year, of course, the yield this season has been good; the drought of last year practically suspending bleeding operations. There is as yet no intimation of any more local balata companies ceasing operations.

DIMINISHED REVENUE FROM SURINAM IMPORT DUTIES.

Reports from Surinam are to the effect that the receipts from import duties for the six months ending June last amounted to $32,000 less than for the corresponding period of 1912.

This falling off is attributed to the depressed condition of the agricultural and balata industries. Hopes are, however, entertained that the purchasing capacity of the bleeders will be increased during the second half of the current year, through the larger supplies of balata now coming forward.

RUBBER BUYING AND CULTIVATION IN THE BAHAMAS.

The November issue of this paper contained a news item concerning the enterprise of a Boston syndicate in planting the *Cryptostegia grandiflora* in the Bahamas. Additional information has since been received. The proposed operations will be under the general charge of Dr. Charles S. Dolley, formerly Dean of the Biological Department of the University of Pennsylvania, who has lately been associated with several companies in Mexico City as Industrial Biologist and Chemist. He is assisted by Mr. W. M. Musgrave, an industrial chemist of Mexico City. Members of the syndicate already control about 25,000 acres of land in Mexico. Owing, however, to the unsettled conditions in that country, it was decided to make the first attempt to utilize this plant on a commercial scale in the Bahama Islands.

AUTOMOBILES IN URUGUAY.

It is estimated that there are about 2,500 motor cars in Uruguay, one-half of the number being in Montevideo. This fact is attributed to the hundred miles of macadamized roads which traverse the agricultural parts of the country. American machines are said to number about one-half of the total.

RUBBER PLANTING IN THE DUTCH EAST INDIES.

By Our Correspondent in Japan.

JAPAN is taking a lively interest as to rubber planting in the East generally, as a guide regarding Japanese investments in other parts of the Orient, and in view of the possible development of that industry in Japanese territory.

An instance of this is afforded by the report sent to his government by the Imperial Japanese Consul at Batavia, in anticipation of the Batavia Exhibition of 1914. The report contains the following interesting statistics:

STATISTICS OF DUTCH INDIA (JANUARY, 1913).

Java.

	Plantations in Java.	Bouws.*	Trees.
Private	332	124,400	500,000
Official	...	11,610	.....
Grade of trees, private plantations:			
Pará		106,460	213,000
India Rubber (unclassified)		9,500	51,000
Castilloa		3,140	186,000
Manihot		5,300	50,000
		124,400	500,000

(*1 bouw = 1.75 acre.)

SUMATRA.

Official reports of the rubber planting industry in the State of Ringat and the other centers showed, in the beginning of 1906, 6,140 acres; 1911, 160,000 acres; 1912, 220,000 acres, and in 1913, 280,000 acres. For comparison, the figures of the Malay Peninsula are quoted: 1906, 100,000 acres; 1913, 452,000 acres.

DEVELOPMENT OF INDUSTRY.

The area available for rubber plantations is ample, but operations are impeded by shortness of labor and lack of communications. A tendency is being manifested to convert tobacco fields into rubber plantations, owing to the low price of the former article and the financial strain of holding that staple.

Plantations were tried at various elevations up to 1,000 feet above sea level; the growth being very fast, as the soil is fertile and temperature and rainfall adapted for rubber planting. Diseases arising from worms are unknown in this district. With the exception of damage from hurricanes to the trunks of rubber trees, it is exempt from weather troubles.

INVESTMENTS.

Present investments in Sumatra rubber plantations represent about 52 millions of dollars, three-fourths of which amount was invested after 1910. The estimated cost of planting equals about $525 per acre. The cultivation of 1,750 acres, including planting and trimming trees up to the beginning of the tapping period (4 years), is estimated to represent about $120,000. Rubber planting is said to be more profitable than in the British Malay States, owing to exemption from export duty and to exporters being more favorably situated as to currency.

In the Dutch Indies there are said to be 548 plantations, of which 332 are in Java and 216 in other Netherlands possessions.

PLANTING AND LABOR.

Pará rubber is planted one tree in a space of 20 feet square, or about 108 trees to the acre. The methods of cultivation and coagulation are the same as in Ceylon and the Malay Peninsula. Workers are chiefly recruited from Java, their usual term of employment being three years. The Javanese workers receive per day the equivalent to 12 to 14 cents American.

The yield from 37,000 six and one-half year Pará trees in Ringat was 3.42 pounds of crude rubber per tree for eight months, 800 trees of eleven years' growth giving for eight months seven pounds of rubber each. The crude rubber product of Sumatra was estimated in 1911 as 1,700 tons and by 1919 is expected to reach 44,000 tons.

THE CENTRAL SELLING AGENCY.

According to the English financial press, the scheme for the establishment of a central rubber selling agency has received additional support from the invitation extended by the Malacca Plantations, Limited, to other rubber plantation companies to co-operate in the movement for a general selling agency. The Malacca company is shown by statistical returns to be the largest of the plantation corporations, having a total area of 24,717 acres, of which 15,000 are planted. Its output ranks first among those of the producing companies, the figures for twelve months, in pounds, having been: 1907, 7,000; 1908, 46,890; 1909, 236,969; 1910, 387,695; 1911, 1,074,906; 1912, 2,180,000.

That this leading company should have taken such a part in the new proposal augurs well for its success. Several firms of prominent rubber brokers have promised their support and will, it is expected, influence their principals in the same direction.

Actual and tentative promises of support have been received by the Malacca company from the representatives of 100 companies, with a combined capital of $50,000,000, or between one-fifth and one-sixth of that invested in the sterling companies.

Mr. L. T. Boustead, in the course of a recent speech, remarked that as one of many remedies for present conditions, the Central Selling Agency, combined with the suggested standardization of plantation rubber, should be a power for good, if properly controlled, sufficiently supported, adequately financed and run *pro bono publico* rather than for the benefit of any one or more groups. In fact he looked on the standardization proposal as being nearly as important as the central agency. In either form, the plan would steady the market, but a central agency cannot alter the laws of supply and demand. It might control the supply, but how about the demand? What is wanted is to increase it in proportion to the increasing supply. In conclusion he remarked: "What we need is a rubber trust, not for plantations, but for financing the manufacture of our products."

IS PLANTATION RUBBER OVER-PREPARED?

Mr. G. H. L. Wharton, in a recent letter to the "Financial News," of London, questions the advantage of subjecting plantation rubber to the many processes of preparation. The manufacturer buys Fine Hard Pará and the admittedly inferior Ceará and *Castilloa* in a rough-and-ready condition and is asked why he must have plantation rubber in a highly prepared state. Mr. Wharton suggests that if the rubber was simply cured and left an adequate time to dry, it would have a much better chance against its rival from Brazil.

INCREASED STOCKS OF INFERIOR WILD RUBBER.

A comparison of the stocks of inferior grades of wild rubber for three years shows a considerable increase, thus indicating that demand is falling off:

LIVERPOOL STOCKS.	1911 Tons.	1912 Tons.	1913 Tons.
Peruvian	459	315	560
Maniçoba, Ceara, etc.	216	206	388
African	332	184	352
Total Liverpool	1007	705	1250
ANTWERP STOCKS	418	405	951
Total	1425	1110	2201

The market has evidently little use for these classes of rubbers while the best grades are obtainable at existing prices.

"The Financier" remarks that this accumulation of lower grade wild rubber can hardly be viewed with indifference, but unless absorbed or destroyed will act as a serious drag on prices. The withdrawal of the Kasai Company from the Congo rubber trade is understood to have been caused by the poor prices obtained. The anticipation has been expressed that the withdrawal of the company will have a favorable effect upon the market.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED OCTOBER 7, 1913.

NO. 1,074,595. Bathing shoe. A. Aumont, Montreal, Quebec, Canada.
1,074,780. Syringe. J. H. L. Eager, Brooklyn, N. Y.
1,074,817. Life preserver. E. Russell, Enid, Okla.
1,074,846. Device for promoting deep breathing. C. F. Dickman and J. P. Dickman, Dayton, Ohio.
1,074,881. Dry viscose in a granular, soluble, and stable condition and process of preparing the same. Hans Lyncke, Berlin, Germany.
1,074,899. Wheel tire. C. L. Schwarz, Philadelphia, Pa.
1,074,928. Electric heating element. T. M. Caven, assignor to A. J. Lindemann & Hoverson Co.—both of Milwaukee, Wis.
1,074,979. Milking apparatus. Otto G. Rieske, Beaver Dam, Wis., assignor to A. J. Euchenhofner, Indianapolis, Ind.
1,075,122. Life saving device. J. Scarlett, Seattle, Wash.
1,075,168. Elastic road wheel. J. Spyker, Amsterdam, Netherlands.
1,075,303. Interchangeable resilient heel. H. P. Roberts, Boston, Mass.

Reissues.

13,626. Vehicle tire. M. C. Overman, New York.

Trade Marks.

61,882. Felten & Guilleaume Carlswerk Actien Gesellschaft, Mulheim-on-the-Rhine, Germany. The word *Neptune*. Insulated cables, etc.
70,670. Mystic Rubber Co., Medford, Mass. The initials *D M D*. Rubber bathing caps, etc.
71,913. The Imperial Merchandise Co., Perry, Ohio. The word *Imperial* across front of crown. Jar rings.

ISSUED OCTOBER 14, 1913.

1,075,345. Pneumatic tire. F. C. Feiker, Racine, Wis.
1,075,501. Demountable rim for pneumatic tires. R. P. Scott, Cadiz, Ohio.
1,075,688. Spring wheel. H. Boardman, Des Moines, Iowa.
1,075,801. Tire rack. B. L. Waters, assignor to Lyon Metallic Mfg. Co.—both of Aurora, Ill.
1,075,822. Dating machine. E. E. Gregory, Central City, Ky.
1,075,824. Portable wall paper hanger. A. C. Harry, Portsmouth, Ohio.
1,075,831. Elastic webbing. S. Kops, assignor to Kops Bros.—both of New York.
1,075,838. Spring wheel. W. L. Mann, St. Joseph, Mo.
1,075,906. Sanitary sand blast helmet. W. Duncan and J. A. Spangler, Attica, Ind.
1,075,917. Adjustable shoe for auto tires. W. A. Jackson and E. L. Sherbondy, Los Angeles, Cal.
1,075,930. Protective overboot. M. W. Murray, St. Joseph, Mo.
1,075,992. Vehicle tire. A. W. Savage, Duarte, Cal.
1,075,993. Vehicle tire. A. W. Savage, Duarte, Cal.
1,076,003. Spring wheel. W. J. Cook and P. Cook, Albany, N. Y.

Designs.

44,723. Vehicle tire. W. W. Duncan, Watertown, Mass, assignor to Hood Rubber Co., Boston, Mass.
44,734. Tire. G. E. Starr, San Francisco, Cal.
44,735. Tire. G. E. Starr, San Francisco, Cal.
44,736. Tire. G. E. Starr, San Francisco, Cal.
71,675. Shiverts & Simon, New York. The word *Oval* in oval shape. Boots, shoes, etc.
72,179. The Tire Treatment Co., Detroit, Mich. The words *New Era*. A compound for sealing punctures in inflatable tires.
72,941. Hercules Rubber Co., New York. The word *Leatherite*. Fabric for vehicle tops.

ISSUED OCTOBER 21, 1913.

1,076,024. Cushion tire. C. M. Culp, South Bend, Ind.
1,076,031. Contracting band for knickerbockers. D. Gamble, New York.
1,076,045. Hose coupling. A. B. Lemon and C. C. Culver, Alluwe, Okla.
1,076,060. Ballast device. R. A. D. Preston, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,076,127. Automobile tire. C. Krikava, Burchard, Neb.
1,076,128. Hose nozzle. E. Kupperle, St. Louis, Mo.
1,076,178. Wheel of road vehicles. C. K. Welch, Coventry, England.
1,076,195. Manufacture and production of a caoutchouc like material. K. Delbrück and K. Meisenburg, assignors to Farbenfabriken vorm. Friedr. Bayer & Co.—all of Elberfeld, Germany.
1,076,196. Substance similar to caoutchouc and process of making same. K. Delbrück and K. Meisenburg, assignors to Farbenfabriken vorm. Friedr. Bayer & Co.—all of Elberfeld, Germany.
1,076,221. Dilating syringe. A. L. Miner, Bellows Falls, Vt.
1,076,238. Detachable rim for vehicle wheels. A. Schick, assignor to Schick Wheel & Tire Co.—both of Wheeling, W. Va.
1,076,239. Vehicle wheel. A. Schick, assignor to Schick Wheel & Tire Co.—both of Wheeling, W. Va.
1,076,254. Resilient wheel. W. Wheeler, Des Moines, Iowa.
1,076,265. Loop for hose supporters. S. Buyer, Yonkers, N. Y.
1,076,267. Tire valve. F. B. Carlisle, Malden, assignor to Standard Auto Valve Co., of Massachusetts.
1,076,287. Abdominal supporter. F. Z. Husar, Chicago, Ill.
1,076,345. Tire shoe. A. S. Bullock, Aitkin, Minn.
1,076,349. Rubber like substance and process of making same. H. A. Clark and E. J. Larkin, New Orleans, La., assignors to C. W. Benedict, St Louis, Mo.
1,076,425. Syringe. J. J. Holland, Philadelphia, Pa.
1,076,430. Demountable rim. W. F. Jenkins, Richmond, Va.
1,076,490. Massage treatment. H. Dreuw, Berlin, Germany.
1,076,526. Wire coating and spooling machine. M. D. Shiverick, assignor to W. E. Milbank—both of Albany, N. Y.
1,076,575. Process for producing beta-gammadimethylerythrene. F. Hofmann, K. Delbrück and K. Meisenburg, assignors to Farbenfabriken vorm. Friedr. Bayer & Co.—all of Elberfeld, Germany.
1,076,591. Wheel with multiple and balanced rims. H. Lottie, St. Jean d'Angely, France.
1,076,603. Hosiery. D. O'Donnell, New York.

Trade Marks.

64,779. Felten & Guilleaume Carlswerk Actien Gesellschaft, Mulheim-on-the-Rhine, Germany. The initials *F G* over the word *Neptune* in circle. Air tubes for wheel tires, etc.
71,007. Ungarische Gummiwaaren Fabriks Actiengesellschaft, Budapest, Austria Hungary. The word *Tauril*. Hollow and solid rubber tires.
71,506. J. W. Buckley Rubber Co. New York. The word *Steamship*. Rubber tubing, rubber hose, etc.
72,888. C. J. Higley, New York. Oblong of plaid. Hose supporters.

ISSUED OCTOBER 28, 1913.

1,076,675. Hose supporter. E. Jennings, New York.
1,076,719. Emergency automobile tire. L. M. Tichenor, Owensville, Ind.
1,076,722. Device for practising golf putting. C. M. Treadwell, London, England.
1,076,730. Separable rim for automobile wheels. W. A. Wirth, St. Louis, Mo.
1,076,735. Wheel. W. E. Babbitt, Worcester, Mass.
1,076,744. Demountable rim for pneumatic tires. C. R. Cantrell, St. Louis, Mo.
1,076,004. Non-skidding device. W. G. Murray, San Francisco, Cal.
1,076,914. Resilient wheel. E. A. Schlairet, Mt. Vernon, N. Y.
1,076,916. Tire. E. J. Shaut and W. A. Dunham, Jackson, Mich.
1,076,981. Tire deflating cap. J. H. Hard, Osmond, Neb.
1,077,011. Deflating device. W. F. Sprick, Stickney, S. D.
1,077,044. Automobile wheel and tire. G. M. Davenport, Keo, Ark.
1,077,085. Vehicle tire. R. L. Leach, Honolulu, Hawaii.
1,077,121. Resilient ball. F. A. Cigol, Paterson, N. J.
1,077,125. Fabric for tire casing. H. J. Doughty, Edgewood, R. I.
1,077,127. Process of forming a tire casing. H. J. Doughty, Edgewood, R. I.
1,077,128. Vehicle tire. H. J. Doughty, Edgewood, R. I.
1,077,029. Endless tread for automobile wheels. T. Douglas, New York.
1,077,140. Balata insulated submarine cables. F. Jacob, Westcomb Park, England, assignor to Siemens & Halske A. G., Berlin, Germany.
1,077,143. Abrading disk. C. Krug, Frankfort-on-the-Main, Germany.
1,077,176. Vehicle tire. J. H. Tucker, Petersburg, Va.
1,077,177. Storm coat. A. J. Vagas and M. F. Vagas—both of Youngstown, Ohio.
1,077,233. Vehicle wheel rim. E. C. Shaw, assignor to The B. F. Goodrich Co.—both of Akron, Ohio.

Design.

44,783. Bathing cap. E. A. Guinzburg, New York.

Trade Marks.

61,887. Felten & Guilleaume Carlswerk Actien Gesellschaft, Mulheim-on-the-Rhine, Germany. The word *Neptune*. Rolls, molds, plugs, etc.
64,780. Felten & Guilleaume Carlswerk Actien Gesellschaft, Mulheim-on-the-Rhine, Germany. The initials *F G* over word *Neptune* in circle. Molds, rolls, plugs, etc.
68,251. United & Globe Rubber Mfg. Co., Trenton, N. J. The word *Globe* written through center of illustration of globe. Non-metallic tires.
70,981. Northern Shoe Co., Duluth, Minn. The word *Farmpruf*. Boots and shoes, etc.
72,193. Phelps Mfg. Co., Providence, R. I. Small illustration of Chinaman applying liquid dressing to shoe.

[NOTE.—Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1911.
Denotes Patents for American Inventions.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 1, 1913.]

13,461 (1912). Jackets and covers for wheel tires. W. C. Platts, Manor House, Kettlewell, and E. Wroe, 31 Newmarket street—both in Skipton.

13,475 (1912). Life saving jackets. G. M. Boddy, 8 Leadenhall street, and W. Carroll, 44 Boxley Road, West Silvertown—both in London.

13,476 (1912). Tread bands for wheel tires. G. Milse, 69 Aufden Häfen, Bremen, and A. Wohlcken, Lehe near Bremerhaven—both in Germany.

13,481 (1912). Inflatable life saving apparel. J. Schwab, 434 Spadina avenue, Winnipeg, Canada.

13,507 (1912). Jackets and covers for wheel tires. A. E. Wale, Coleshill, near Birmingham, and Wales Invulnerable Tyre Syndicate, Broad Street House, London.

13,539 (1912). Air tubes and chambers for wheel tires. M. G. Fossi, 6 Piazza Peruzzi, Florence, Italy.

13,541 (1912). Golf balls. H. G. Poole, 55 Kent Road, Gravesend, and C. T. Lehmann, 4 Monument street, London.

13,563 (1912). Inhalers. C. G. Cenatro, 4 Calle de la Abada, Madrid.

13,591 (1912). Caoutchouc substances. P. A. Newton, 6 Breams buildings, Chancery Lane, London.

13,613 (1912). Air tubes and chambers for tires. H. K. Heide, 44 Lucile Grahnstrasse, Munich, Germany.

13,638 (1912). Making solid rubber tires. R. Bridge and J. Bridge, Castleton Ironworks, Lancs.

*13,652 (1912). Life saving suit with rubber shield. T. E. Aud, Herndon, Va., U. S. A.

13,687 (1912). Apparatus for detecting and closing tire punctures. H. W. Lake, 7 Southampton buildings, London.

13,754 (1912). Horseshoes with rubber pads. G. Dugher, Awkley, near Doncaster.

13,809 (1912). Apparatus for treating rubber plants. S. Goldreich, 2 Broad Street Place, and J. L. Palmer, 18 Ropemaker street—both in London.

13,819 (1912). Rubber lined clip for suspending umbrellas, etc., for display. E. H. Ledger, Allscott House, Wellington, Shropshire.

13,833 (1912). Apparatus for detecting and closing punctures in pneumatic tires. J. T. McGuire, 69 Northcote street, Arthur's Hill, Newcastle-on-Tyne.

13,845 (1912). Spring lining for outer tire cover. A. T. Edwards, P. O. Box 219, Cape Town, South Africa.

13,957 (1912). Horse boots and bandages adjusted by means of rubber strips. H. W. A. Salter and J. O. Salter, 23 High street, Aldershot, Hampshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 8, 1913.]

14,012 (1912). Tire vulcanizer. Dunlop Rubber Co. and J. V. Worthington, Manor Mills, Salford street, Aston, Birmingham.

*14,057 (1912). Hand stamps. O. Ferguson, Porter, Minn., U. S. A.

*14,062 (1912). Corsets with elastic skirt strips. D. Kops, 435 Riverside Drive, New York, U. S. A.

14,180 (1912). Dental plate with vulcanized rubber stem. J. Dukes, 121 New Chester Road, New Ferry, Cheshire.

14,309 (1912). Tread bands, projections and surfaces for wheel tires. D. Marshall, 30 Winchcombe street, Cheltenham, Gloucestershire.

14,334 (1912). Corset waist with elastic hose supporters. Spirella Co., Letchworth, Hertfordshire.

*14,372 (1912). A rubber shoe securing device. J. A. Baldwin, 5 West street, Maynard, and L. D. Apsley, 21 Pleasant street, Hudson—both in Massachusetts, U. S. A.

14,537 (1912). Gutta percha embossing die. G. Moncany, 10 Cite Joli, Paris.

14,556 (1912). Synthetic caoutchouc. P. A. Newton, 6 Breams buildings, Chancery Lane, London.

14,619 (1912). Tread bands for wheel tires. P. V. J. Jeppesen, 20 Jens Benzonsgade, and V. Petersen, "Aldersbaab," Myborg, Landevej—both in Odense, Denmark.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 15, 1913.]

14,665 (1912). Rubber substitute. D. d'Ameida, 16 Cuppage Road, Singapore, Straits Settlements.

14,720 (1912). Suction or force cup comprising an elastic dome. H. Macfarlane, 317 High Holborn, London.

*14,737 (1912). Corsets with elastic straps. D. Kops, 435 Riverside Drive, New York, U. S. A.

14,757 (1912). Detachable rim attachment to wheels. Daimler-Motoren-Ges, Fabrikstrasse, Untertürkheim, near Stuttgart, Germany.

*14,761 (1912). Air tubes and chambers for wheels. W. P. Gordon, H. P. Barhite and W H. Barhite, Lakeland, Fla., U. S. A.

*14,795 (1912). Jackets and covers for wheel tires. J. Lend, 53 West Jackson Boulevard, Chicago, Ill., U. S. A.

*14,854 (1912). Spring wheels with continuous outer rigid ring and pneumatic, rubber ring and like hubs. H. O. Shockley, Darlington, Wis., U. S. A.

*14,865 (1912). Tire attachments to rims. W. D. McNaull, 448 East Broadway, Toledo, Ohio, U. S. A.

14,947 (1912). Waterproof sheet covers for seats, hand bags, etc. B. G. Cope, Bradford House, Bloxwich, near Walsall.

15,073 (1912). Mud guards with rubber plate for vehicles. F. W. Kohler, 18 Danmarksgade, and H. T. Bode, 238 Ostre Fasanvej—both in Copenhagen.

15,100 (1912). Wearing apparel. A. W. Glover, Newton Road, Leeds.

15,115 (1912). Tread bands for wheel tires. A. W. Torkington, 11 Queen Victoria street, and Wale's Invulnerable Tyre Syndicate, Broad Street House—both in London.

15,145 (1912). Life saving buoys. F. W. Kowalski, 19 Juliusstrasse, Lodz, Russia.

15,153 (1912). Detachable rim attachments to wheels. Daimler-Motoren-Ges, Fabrikstrasse, Untertürkheim, near Stuttgart, Germany.

*15,159 (1912). Wheel tires. L. J. Tetlow, 65 Piper Road, West Springfield, Mass., U. S. A.

[APPENDIX TO ABRIDGMENTS OF SPECIFICATIONS.]

[In place of 613, redated July 6.]

613 (1911). Wheel tires. W. E. Muntz, Royal Automobile Club, Pall Mall, London.

[In place of 2,895, not yet accepted.]

2,895 (1911). Damping pads with collapsible bulb. E. H. Horstmann, 10 Widcomb Crescent, Bath.

[In place of 6,846, redated August 28.]

6,846 (1912). Driving belts. E. Lycett, Bromley street, Birmingham.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 22, 1913.]

15,285 (1912). Damping pad with threads held by rubber band. A. R. M. Keefe, 52 Newhall street, and P. R. Erskine, 101 Commercial Road—both in Swindon, Wiltshire.

15,347 (1912). Soft rubber button for hose suspenders. R. B. Ransford, 24 Southampton buildings, London.

15,350 (1912). A rubber cone for phonographs, etc. F. J. Empson, 10 Castlereagh street, Sydney, Australia.

15,455 (1912). A tread band for attachment to the outer cover of a tire. E. C. R. Marks, 57 Lincoln's Inn Fields, London.

15,474 (1912). Self-filling rubber reservoir pens. P. Hayman, 8 Long Lane, London.

15,526 (1912). Elastic lining grip for shoes. G. T. Hawkins, Waukerz Boot Factory, Overstone Road, Northampton.

15,560 (1912). Vehicle wheels. T. H. Holroyd, 34 Morley Road, East Twickenham, Middlesex.

15,572 (1912). Reservoir pens. J. Y. Johnson, 47 Lincoln's Inn Fields, London.

15,608 (1912). Vehicle wheels with resilient blocks. W. T. G. Ellis, 150 Bothwell street, Glasgow.

15,641 (1912). Spring wheels with continuous outer rigid ring and rubber ring. J. Guerriro, 5 Square de Messine, Paris.

15,680 (1912). Process for manufacturing india rubber springs or elastic diaphragms. A. G. Spencer, 77 Cannon street, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 29, 1913.]

15,728 (1912). Diving apparatus with rubber air bags. L. Durland, 55 Piazza Olivuzza, and M. Bembina, 16 Via Guiseppe Piazza ai Lolli—both in Palermo, Italy.

15,751 (1912). The outer cover of a pneumatic tire. H. P. Plicht, 14 Sedanstrasse, Leipzig, Germany.

15,844 (1912). A non skid tire protector. R. Müller, 26 Schiljanska street, Kiew, Russia.

15,896 (1912). Rubber covered protectors for shoes. T. H. B. Gayner, 15 Salisbury House, Highbury Corner, London.

15,944 (1912). A knitted fabric for tire covers. W. E. Mutz, 89 Pall Mall, London.

15,984 (1912). Rubber coated rolls for paper machines. E. Fullner, Herischdorf, near Warmbrunn, Schlesien, Germany.

*16,047 (1912). A plastic composition for filling tires. T. P. Day, Fort Worth, Texas, U. S. A.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

456,444 (April 8, 1913). Shock-resisting pneumatic tires for automobiles and other vehicles. P. Sikirizza and A. Gardun.

456,476 (April 9). Process for repairing burst tires. P. Minaud.

456,497 (June 19, 1912). Air chamber for tires. M. Leblant.

456,559 (April 11, 1913). Mud guards for vehicle wheels. C. Lefevre and H. Warlazier.

456,584 (June 22, 1912). Fittings for pneumatic tires. Mendes de Almeida.

456,486 (April 9, 1913). Process for increasing the yield of Pará rubber trees. Treasury of Cameroon Protectorate.

456,586 (June 22, 1912). Synthetic rubber. C. E. Anquetel.

456,607 (April 12, 1913). Improvements in vehicle tires. A. A. Picard.

456,680 (April 15). Elastic wheel M. D. McGown.

456,690 (June 24, 1912). Portable press for fitting rubber tires on wheels. Delahaye & Cie., Ltd.

456,839 (June 27). Elastic tires. C. Morel.

456,847 (April 19, 1913). Mud guards for automobiles and other vehicles. Desobry & Librecht.

456,998 (January 16). System and process of making linen carcasses for tire covers. Saracio Company.

457,030 (July 2, 1912). Elastic tires for automobiles and other vehicles. H. Farjas.

457,047 (April 2, 1913). Pneumatic heel and tire. J. Anthony.

457,062 (April 11). Rubber tire with protective cover. P. Duret.
457,094 (April 24). Improvements in covers of pneumatic tires. J. P. Tye and C. Hanks.
457,147 (July 4, 1912). Improvements in twin pneumatic tires. H. N. J. Portier.
457,187 (July 5). Mud guards for vehicles. Tahier.
457,254 (April 25, 1913). Cover for pneumatic tire. P. Perrin.
457,343 (April 8). Improvements in elastic tires. R. Rousselon.
457,372 (July 2, 1912). Improvements in anti-perforation tire covers. S. C. Caddy.
457,417 (May 3, 1913). Mud guards for vehicle wheels. C. Engelking.
457,440 (July 10, 1912). Improvements in covers for elastic tires. E. Mayen.
457,445 (May 3, 1913). Elastic tire. C. G. Lambert.
457,456 (May 5). Hollow tire. H. Behnisch.
457,460 (May 5). Tires for vehicle wheels. Donandy.
457,468 (May 5). Fixing tires on wheels. L. G. Fleming.
457,476 (May 5). Improvements in elastic tires and in appliances for fitting them. H. Rousselon.

[NOTE.—Printed copies of specifications of French patents can be obtained from R. Bobet, Ingenieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED WITH DATE OF VALIDITY.

266,342, Class 81 (September 21, 1912). Process for manufacture of armored hard rubber. Joseph Theodor Szék, Brussels.
266,402, Class 120 (January 11, 1912). Manufacture of isoprene and its homologues from dipentenes. Dr. Iwan Ostromisslensky and the "Bogatyr" Company, Moscow.
266,403, Class 120 (July 6, 1912). Process for manufacture of isoprene. Court Gross, Christiania.
266,153, Class 39b (May 26, 1912). Prevention of resinification in polymerization. Farbenfabriken vorm. Friedr. Bayer & Co., Leverkusen.
266,242, Class 63e (June 30, 1912). Rubber tires with transverse hollow spaces, over each other. Albert Witzel, Ludwigsburg.
266,618, Class 39b (November 16, 1912). Manufacture of a product from hard rubber. Farbenfabriken vorm. Friedr. Bayer & Co., Leverkusen.
266,619, Class 39b (December 25, 1912). Quickening vulcanization of natural or artificial rubbers. Farbenfabriken vorm. Friedr. Bayer & Co., Leverkusen.
266,887, Class 39b (December 29, 1912). Regenerated rubber from rubber waste containing cellulose. Orrin A. Wheeler, Edward D. Lowenthal and Berthold Lowenthal, Chicago, Ill.
266,957, Class 39b (April 16, 1912). Substitute for rubber or putty. Thomas Daniel Kelly, Southend-on-Sea.
266,851, Class 63e (September 11, 1912). Rubber tires with transverse perforations covered from outside. Michael Martin Weiss, Cleveland, Ohio.
266,895, Class 63e (January 4, 1913). Signal of wind escape from pneumatic tires. Wilhelm Rothe, Reichenbach, Silesia.
267,419, Class 30d (March 29, 1912). Woven or knitted bandage materials. Dietrich Grote, Nachf. Kempen, Rhine.
267,277, Class 39b (November 28, 1912). Regeneration of rubber. Dr. Carl Harries, Kiel.
267,476, Class 39b (October 23, 1910). Manufacture of artificial rubber. Georges Reynaud, Paris.

THE KINGDOM OF BELGIUM.

PATENTS PUBLISHED.

258,760 (1912). Rubber pad for preventing excoriation in riding. C. de Klecki, Wielopole 8, Cracow, Austria.
258,807 (1912). Process of vulcanizing objects of rubber and similar materials. V. Thomas, Rabanesse Clermont-Ferrand, France.
258,991 (1912). Process and appliances for drying materials. G. Desaules, Rue Georges Sand 21, Paris.
259,020 (1912). Portable tent. L. Cassis, Rue Marie Henriette, Uccele.
259,048 (1912). Process and appliance for extracting rubber from parts of vegetables. F. Kempter, Heinestrasse 10, Stuttgart, Germany.

WHEN THE TIRE DEFLATES THE BELL RINGS.

All the experts on tires insist, in season and out of season, that the one chief cause of tire degeneracy is deflation, and that if the motorist would keep his eye constantly on the tire to see that it is properly inflated his troubles would be greatly decreased. A certain inventive genius has come to the assistance of the motorist with a device that renders it unnecessary for him to keep his eye constantly on the tire, as this will do the work for him. It is a small piece of metal in the shape of a "U" and goes over the tire, having two plungers which drop past the rim. When the tire is entirely inflated nothing happens, but when the air begins to escape and the tire to go a trifle flat these two plungers are driven up a little further past the rim and strike a bell. The motorist then knows it's time to insert more air.

FIGHTING FIRE ON SHIPBOARD.

THERE is no place in the world where it is so essential to stop a fire as on shipboard, as it is a case of conquering the fire or going down. Every precaution is taken against the spread of incipient blazes. Among these precautions is the use of the fire-fighting apparatus shown in the accompanying sketch, which consists of a smoke helmet attached to a rubber tube at the other end of which there is a fresh air bellows. When it is necessary for one of the crew to take the nozzle of the water hose into a compartment dense with smoke, where breathing would be impossible or exceedingly difficult, he has only to adjust this smoke helmet to his head, while a comrade outside works the bellows and keeps him supplied with an abundance of fresh air.

FIRE-FIGHTING APPARATUS—SMOKE HELMET CONNECTED WITH AIR BELLOWS.

WATER PAILS OUT OF OLD INNER TUBES.

A contributor to the "Automobile Trade Journal," who has an inventive turn of mind, makes the following suggestion for utilizing old inner tubes as collapsible water pails:

"Altho collapsible water pails can now be purchased very cheaply, it is well to know how easily a useful one can be made without any expense. If three or four feet of good rubber is selected from an old inner tube a water pail of the desired length can be made by cutting off a portion of the tube and cementing one end under pressure so that it is closed watertight. Such an article as this can be carried in almost any part of the car, and may prove very useful in filling a radiator from a roadside stream."

Report of the Crude Rubber Market.

HAVING reached on October 11 the price of 3*s.* 5*d.* in the London market, fine Pará had dropped by October 27 to 3*s.* 1½*d.* An alternation of slight gains and loses brought it by November 17 to 3*s.* 4*d.*, close to the price of October 11. After keeping for a few days at about this level, a reduction to 3*s.* 2*d.* had taken place by the 22d, the time of writing. Thus the month ends for Pará rubber in London about where it began.

Plantation, which started the month at about 2*s.* 2*d.*, stood at 2*s.* 3*d.* on November 8, from which point it gradually rose to 2*s.* 6*d.* on the 19th, standing on the 22d at 2*s.* 4¾*d.*

Comparing the movements of the last three months, the following results are found:

1913.	Upriver Fine Pará.	Plantation.	Difference.
August 27	3*s.* 9½*d.*	2*s.* 8 *d.*	1*s.* 1½*d.*
September 27	3*s.* 7½*d.*	2*s.* 3½*d.*	1*s.* 4 *d.*
October 4	3*s.* 4 *d.*	2*s.* 1¼*d.*	1*s.* 2¾*d.*
October 11	3*s.* 5 *d.*	2*s.* 1¾*d.*	1*s.* 3¼*d.*
October 18	3*s.* 2½*d.*	2*s.* 1 *d.*	1*s.* 1½*d.*
October 27	3*s.* 1½*d.*	2*s.* 2 *d.*	11½*d.*
November 1	3*s.* 1¾*d.*	2*s.* 2¼*d.*	11½*d.*
November 8	3*s.* 2½*d.*	2*s.* 3 *d.*	11½*d.*
November 15	3*s.* 3½*d.*	2*s.* 4¼*d.*	11¼*d.*
November 22	3*s.* 2 *d.*	2*s.* 4¾*d.*	9¼*d.*

The purchasing operations of the month have been both cautious and restricted, buyers evincing a desire to limit their action to urgent requirements.

Thus the premium in favor of Pará, which constitutes the principal factor of interest in the market, now stands at a lower rate than at any time since the middle of the year, now being at 9½*d.* against 11½*d.* on October 27. In fact plantation has gone up 2*d.* without any corresponding rise in Pará standard.

Deliveries of plantation rubber in October were 3,055 tons, against arrivals, 3,355 tons. Last year at same time the figures were respectively, 2,116 and 1,993. The increased purchasing capacity of the market is thus proved. The world's visible supply of Brazilian rubber on October 31 was 5,930 tons, against 5,310 tons at the end of September.

Statistics of the 22 series of plantation rubber auctions which took place this year in London before the end of October, show that 18,484 tons were auctioned during the period, against 14,500 during the corresponding months of 1912. Two auctions were held in November. The first one, on the 4th, included 960 tons, as compared with 1,200 tons a fortnight earlier.

Havre reports state that the sale of October 29 resulted in the disposal of 33 tons out of 53 tons offered, prices showing a slight decline. For the sale of November 26, 95 tons were inscribed.

At the Rotterdam sale of November 7, 33½ tons were offered, including 23 tons *Hevea* and 10 tons *Ficus*. The competition was animated and higher prices were established.

The sale at Amsterdam on November 13 led to the disposal of 98 tons out of the 105 tons offered, which realized for *Hevea* 8½ per cent. and for *Ficus* 15 per cent. above valuation. The former constituted 90 per cent. of the quantity.

Out of 415 tons offered in Antwerp on October 22, 343 tons were sold. Congos, which had been neglected, are again receiving the attention of buyers, 149 tons having been sold out of 201 cataloged. Of the plantation rubber offered, 194 tons were sold at an advance equaling ½*d.* per pound. Antwerp stock at the end of October was about 425 tons, against 556 tons at same time last year.

NEW YORK QUOTATIONS.

FOLLOWING are the quotations at New York one year ago, one month ago, and November 29—the current date:

PARA.	Dec. 1, '12.	Nov. 1, '13.	Nov. 29, '13.
Islands, fine, new	95@ 96	66@67	66 @67
Islands, fine, old	.....	.....	.....
Upriver, fine, new	106@107	73@74	76 @77
Upriver, fine, old	113@114	76@80	.....
Islands, coarse, new	54@ 55	28@29	29½@30
Islands, coarse, old	.....	.....	.....
Upriver, coarse, new	82@ 83	46@47	48 @49
Upriver, coarse, old	.....	.....	.....
Cametà	55@ 56	36@37	37½@38
Caucho (Peruvian) ball	81@ 82	43@44	46 @47
Caucho (Peruvian) sheet	.....	.....	.....
PLANTATION CEYLONS.			
Fine smoked sheet	111@112	59@60	65 @66
Fine pale crepe	106@107	53@54	58 @59
Fine sheets and biscuits	105@106	51@52	56 @57
CENTRALS.			
Esmeralda, sausage	78@ 79	40@41	40 @41
Guayaquil, strip	.....	.....	.....
Nicaragua, scrap	77@ 78	37@39	37 @39
Panama	.....	.....	.....
Mexican plantation, sheet	.....	.....	.....
Mexican, scrap	76@ 77	37@38	37 @38
Mexican, slab	.....	.....	.....
Mangabeira, sheet	.....	.....	.....
Guayule	58@ 59	.....	.....
Balata, sheet	82@ 83	63@64	63 @64
Balata, block	54@ 55	44@45	44 @45
AFRICAN.			
Lopori, ball, prime	98@ 99	47@48	47 @48
Lopori, strip, prime	.....	.....	.....
Aruwimi	87@ 88	37@38	37 @38
Upper Congo, ball red	97@ 98	45@46	45 @46
Ikelemba	95@ 96	.....	.....
Sierra Leone, 1st quality	98@100	45@46	45 @46
Massai, red	.....	.....	.....
Soudan Niggers	.....	.....	.....
Cameroon, ball	73@ 74	33@40	33 @40
Benguela	.....	.....	.....
Madagascar, pinky	25@ 26	.....	.....
Accra, flake	.....	20@22	20 @22
EAST INDIAN.			
Assam	.....	.....	.....
Pontianak	6¼@ 7	6@6¼	6 @6¼
Borneo	.....	.....	.....

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, 68 William street, New York,) advises as follows: "During November, the general market conditions regarding commercial paper in the rubber line have practically been unchanged from October, the demand being only moderate at full rates, the best rubber names being 5¼ to 6 per cent., and those not so well known 6¼ to 6½ per cent.

NEW YORK PRICES FOR OCTOBER (NEW RUBBER).

	1913.	1912.	1911.
Upriver, fine	$0.73@0.83	$1.04@1.11	$1.00@1.12
Upriver, coarse	.47@ .49	.81@ .86	.90@ .96
Islands, fine	.67@ .72	.99@1.06	.96@1.07
Islands, coarse	.28@ .29	.53@ .56	.56@ .63
Cametá	.36@ .38	.56@ .61	.60@ .66

STATISTICS PARA INDIA RUBBER (IN TONS).

(INCLUDING CAUCHO).

STATISTICS FOR THE MONTH OF OCTOBER.

	Pará.	Caucho.	1913. Tons.		1912. Tons.	1911. Tons.	1910. Tons.
Receipts at Pará	3,300	440	= 3,740	against	3,920	2,990	3,170
Shipments to Liverpool	960	100	= 1,060	"	1,150	1,030	1,070
Shipments to Continental Ports	360	90	= 450	"	530	150	360
Shipments to America	1,460	210	= 1,670	"	2,420	1,640	1,590
American Imports	1,130	230	= 1,360	"	1,620	1,830	1,200
American Deliveries	1,170	210	= 1,380	"	1,680	1,860	1,250
Liverpool Imports	828	147	= 975	"	928	766	430
Liverpool Deliveries	1,018	172	= 1,190	"	1,198	1,126	716
Continental Imports	190	80	= 270	"	320	10	170
Continental Deliveries	170	150	= 320	"	270	30	150

VISIBLE SUPPLY, 1ST NOVEMBER, 1913.

	1913. Pará.	1913. Caucho.	1912.	1911.	1910.
Stock in England, Pará, 1st hands	550	.....	240	1,700	929
Pará, 2nd hands	50	.....			193
Caucho	.....	335	190	180	602
Stock in Pará, 1st hands	440	120	190	400	960
2nd hands	920	80	420	700	60
Syndicate	810	.....	960	2,410	.....
Stock in America	70	60	180	280	330
Stock on Continent	20	40	100	20	100
Afloat—Europe	910	120	910	850	1,300
Afloat—America	590	100	1,200	590	750
	4,360	855			
Total Visible Supply, including Caucho.	5,215		4,390	7,130	5,224

CROP STATISTICS—30TH JUNE, 31ST OCTOBER, 1913.

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Pará Receipts 1913	8,570	1,770	10,340	10,380	8,640	9,350
Pará Receipts 1912	8,960	1,420				
Pará Shipments to Europe	3,720	980	4,700	5,580	4,540	4,500
Pará Shipments to America	4,090	880	4,970	6,380	5,110	4,340
England Landings, net			3,070	4,147	3,509	3,181
England Deliveries, net			3,950	5,087	6,729	3,470
America Landings, net			4,960	4,147	6,360	3,880
America Deliveries, net			5,010	5,520	5,980	3,690
Continental Imports, net			790	1,350	520	700
Continental Deliveries, net			980	1,350	610	650

POSITION—1ST NOVEMBER, 1913.

Decrease in Receipts during October, 1913, against October, 1912	180
Decrease in Receipts—Crop, July/October, 1913, against 1912	40
Decrease in Deliveries—Crop, July/October, 1913, England and Continent, against 1912	1,507
Decrease in Deliveries—Crop, July/October, 1913, America, against 1912	510
Increase in Visible Supply Pará Grades, against 1st November last year	825
Increase in Stock, England, October 31st, 1913, against October 31st, 1912	505

WM. WRIGHT & CO., Brokers,
London, 3rd November, 1913. 21, Mincing Lane, London, E. C.

During the month 80 tons, including 70 tons Caucho, have been shipped from Liverpool to America.

Amsterdam.

JOOSTEN & JANSSEN report [November 13]:

In consequence of the firmer tendency prevailing, today's sale has been very satisfactory. Owners have been able to sell their lots at good prices, in most cases above valuations.

Rotterdam.

HAVELAAR & DE VRIES report [November 7]:

Owing to the better tone in the market and the higher prices in London, today's sale was very animated, with keen competition. The entire quantity was sold above valuations.

Rubber Scrap Prices.

LATE NEW YORK QUOTATIONS.—Prices paid by consumers for carload lots, per pound.

	Nov. 29, '13
Old rubber boots and shoes—domestic	7⅛@ 7¼
Old rubber boots and shoes—foreign	7⅛@ 7½
Pneumatic bicycle tires	4½@ 4¾
Automobile tires	5½@ 5⅝
Solid rubber wagon and carriage tires	8 @ 8½
White trimmed rubber	10 @10¼
Heavy black rubber	4½@ 4⅝
Air brake hose	4⅜@
Garden hose	1 @ 1¼
Fire and large hose	2 @ 2½
Matting	⅛@ ¼
No. 1 white auto tires	6¾@ 7
Foreign auto tires	5¼@ 5⅜

WEEKLY MOVEMENT OF LONDON PRICES FOR FINE PARA, 1913.

[IN SHILLINGS AND PENCE PER POUND.]

January 3, 1913	4/7¼	June 6	3/9¼
January 10	4/6½	June 13	3/9
January 17	4/6½	June 20	3/8¾
January 24	4/5¼	June 27	3/9½
January 31	4/4	July 4	3/9¾
February 7	4/2¾	July 11	3/9
February 14	4/3	July 18	3/9½
February 21	4/0½	July 25	3/8
February 28	4/0½	August 1	3/8½
March 7	3/10¾	August 8	3/10
March 14	3/11¼	August 15	3/10½
March 20	3/11	August 22	3/10
March 28	3/9½	August 29	3/8½
April 4	3/6¼	September 5	3/9
April 11	3/4½	September 12	3/8
April 18	3/4¾	September 19	3/6
April 25	3/4½	September 26	3/7½
May 2	3/5½	October 3	3/4½
May 9	3/8¾	October 10	3/5
May 16	3/10	October 17	3/3
May 23	3/9	October 24	3/1½
May 31	3/8½	October 31	3/1½

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weight in Pounds.]

OCTOBER 25.—By the *Clement* from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss	373,800	65,200	167,400	55,500=	661,900
General Rubber Co	.....	31,600	29,000	10,900=	71,500
Meyer & Brown	337,200	51,300	66,200	31,800=	486,500
Henderson & Korn	46,500	19,600	25,400	18,500=	110,000
G. Amsinck & Co	.....	.....	.....	6,000=	6,000
H. A. Astlett & Co	58,400	12,200	2,200	13,700=	86,500
Total	815,900	179,900	290,200	136,400=	1,422,400

NOVEMBER 3.—Transshipped from *Javary* to *Stephen*, from Pará and Manáos:

Meyer & Brown	5,900	2,500	2,000	44,000=	54,400
Johnstone & Whitworth	30,600	.....	8,600	15,200=	74,400
H. A. Astlett & Co	30,000	400	6,700	12,900=	50,000
W. R. Grace & Co	8,700	2,300	.....	.....=	11,000
G. Amsinck & Co	2,000	.....	.....	.....=	2,000
Total	97,200	5,200	17,300	72,100=	191,800

NOVEMBER 3.—By the *Stephen*, from Pará and Manáos:

Arnold & Zeiss	350,300	63,300	110,100	76,200=	599,900
General Rubber Co	109,700	26,400	25,700	.....=	161,800
Meyer & Brown	120,700	19,100	97,700	71,200=	308,700
Henderson & Korn	73,300	26,100	19,600	5,500=	124,500
H. A. Astlett & Co	.....	.....	22,400	6,300=	28,700
H. A. Astlett & Co	11,100	.....	.....	.....=	11,100
H. A. Astlett & Co	1,500	.....	.....	.....=	1,500
Total	666,600	134,900	275,500	159,200=	1,236,200

NOVEMBER 14.—By the *Hubert*, from Pará and Manáos:

Arnold & Zeiss	300,600	59,100	162,300	14,600=	536,600
General Rubber Co	221,800	26,800	72,200	2,800=	323,600
Meyer & Brown	137,100	22,100	75,200	70,400=	304,800
H. A. Astlett & Co	6,500	.....	61,400	.....=	67,900
Henderson & Korn	6,900	8,100	12,300	8,200=	35,500
G. Amsinck & Co	6,700	900	6,200	2,300=	16,100
Total	679,600	117,000	389,600	98,300=	1,284,500

PARA RUBBER VIA EUROPE

		POUNDS.
OCTOBER 20.—By the *Amerika*=Hamburg:		
Rubber & Guayule Agency, Inc. (Fine)..		8,500
OCTOBER 25.—By the *Baltic*=Liverpool:		
James T. Johnstone (Fine).....		4,500
OCTOBER 25.—By the *Kaiserin Auguste Victoria* =Hamburg:		
Various (Fine)		6,700
NOVEMBER 1.—By the *Cristobal*=Colon:		
W. R. Grace & Co. (Fine).....	7,500	
W. R. Grace & Co. (Caucho Ball)	4,000	
W. R. Grace & Co. (Coarse)....	1,000	12,500
NOVEMBER 3.—By the *Nickerie*=Trinidad:		
Yglesias Lobo & Co. (Fine).....		16,500
NOVEMBER 3.—By the *Cymric*=Liverpool:		
Various (Caucho Ball).....		11,200
NOVEMBER 11.—By the *Caronia*=Liverpool:		
Raw Products Co. (Fine).....	11,200	
Various (Caucho)	3,000	14,200
NOVEMBER 11.—By the *Pretoria*=Hamburg:		
Ed. Maurer (Fine).....	22.500	
Rubber & Guayule Agency, Inc. (Fine)	9,500	
Henderson & Korn (Coarse)....	13,500	45,500
NOVEMBER 15.—By the *Cedric*=Liverpool:		
Arnold & Zeiss (Caucho).....	22,500	
Various (Caucho)	4,000	26,500
NOVEMBER 17.—By the *Commerwijne*=Trinidad:		
G. Amsinck & Co. (Fine).....	1,700	
G. Amsinck & Co. (Coarse).....	2,200	
General Export & Commission Co. (Coarse)	1,500	
General Export & Commission Co. (Fine)	500	5,900
NOVEMBER 18.—By the *Kroonland*=Antwerp:		
R. Badenhop (Fine)		22,500

OTHER NEW YORK ARRIVALS.

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

		POUNDS.
OCTOBER 20.—By the *Allemania*=Colombia:		
H. C. Coleman.....	1,000	
Various	2,000	3,000
OCTOBER 22.—By the *Prinz Joachim*=Colombia:		
Rosenthal & Sons.....		2,000
OCTOBER 22.—By the *Tagus*=Colon:		
G. Amsinck & Co.....	1,200	
A. M. Capen's Sons.....	1,500	
A. Held	200	2,900
OCTOBER 22.—By the *Scottish Prince*=Bahia:		
Adolph Hirsch & Co.....		5.400
OCTOBER 23.—By the *Advance*=Colon:		
G. Amsinck & Co.....		10,000
OCTOBER 23.—By the *Patricia*=Hamburg:		
Various		11,000
OCTOBER 24.—By the *Sarnia*=Frontera:		
E. Steiger & Co.....		1,200
OCTOBER 24.—By the *Monterey*=Mexico:		
Hermann Kluge	1,600	
E. Steiger & Co.....	1,600	
Harburger & Stack.....	1,200	
L. Johnson & Co.....	3,000	7,400
OCTOBER 27.—By the *Prince Eitel Frederick*= Colombia:		
Kunhardt & Co.....	500	
Caballero & Blanco.....	300	800
OCTOBER 27.—By the *Voltaire*=Bahia:		
Adolph Hirsch & Co.....		40,000
OCTOBER 28.—By the *Carl Schurz*=Colombia:		
J. S. Sembrada & Co.....		8,500
OCTOBER 28.—By the *Panama*=Colon:		
G. Amsinck & Co.....	3,100	
M. A. de Leon & Co.....	400	3,500
OCTOBER 30.—By the *Santiago*=Tampico:		
G. Amsinck & Co.....		*100,000
OCTOBER 31.—By the *Sibiria*=Frontera:		
E. Steiger & Co.....		1,000
NOVEMBER 1.—By the *Morro Castle*=Mexico:		
E. Steiger & Co.....	2,200	
G. Amsinck & Co.....	300	
Harburger & Stack.....	500	3,000
NOVEMBER 3.—By the *Albingia*=Colombia:		
Caballero & Blanco.....		500
NOVEMBER 3.—By the *Allianca*=Colon:		
G. Amsinck & Co.....	3,400	
M. A. de Leon & Co.....	3,000	6,400
NOVEMBER 5.—By the *Hungarian Prince*=Bahia:		
Rossbach Bros. & Co.....		26,000
NOVEMBER 5.—By the *Armenia*=Hamburg:		
Rossbach Bros. & Co.....		1,000
NOVEMBER 5.—By the *Oruba*=Colon:		
Lanman & Kemp.....	1,000	
A. M. Capen's Sons.....	2,500	3,500
NOVEMBER 6.—By the *Prince August Wilhelm*= Colombia:		
Andean Trading Co.....	6,000	
Isaac Brandon & Bros.....	700	
Wessels, Kulenkampff & Co.....	500	7,200
NOVEMBER 8.—By the *Vestris*=Bahia:		
Rossbach Bros. & Co.....		8,500
NOVEMBER 10.—By the *Prince Sigismund*=Colombia:		
Caballero & Blanco.....		500
NOVEMBER 10.—By the *Suriname*=Belize:		
General Export & Commission Co.	400	
Eggers & Heinlein	200	600
NOVEMBER 11.—By the *Emil L. Boas*=Colombia:		
H. Wolff & Co.....		3,000
NOVEMBER 11.—By the *Vigilancia*=Mexico:		
G. Amsinck & Co.....		800
NOVEMBER 11.—By the *Pretoria*=Hamburg:		
Henderson & Korn.....		23,500
NOVEMBER 11.—By the *Guantanamo*=Tuxpan:		
Kahn Bros.		*2,000
NOVEMBER 13.—By the *Vaderland*=Antwerp:		
Rubber & Guayule Agency, Inc.....		*22,500
NOVEMBER 14.—By the *President Grant*=Hamburg:		
Various		*20,000
NOVEMBER 15.—By the *Mexico*=Mexico:		
G. Amsinck & Co.....	1,200	
E. Steiger & Co.....	500	
Harburger & Stack.....	303	
J. A. Medena & Co.....	200	2,200
NOVEMBER 17.—By the *Advance*=Colon:		
G. Amsinck & Co.....		2,500
NOVEMBER 19.—By the *Prinz Joachim*=Colombia:		
Andean Trading Co.....	5,000	
Neuss Hesslein	700	5,700
NOVEMBER 19.—By the *Trent*=Colon:		
Mecke & Co.....	1,000	
A. M. Capen's Sons.....	1,000	
G. Amsinck & Co.....	700	
J. S. Sembrada & Co.....	700	
American Trading Co.....	600	4,000
NOVEMBER 19.—By the *Carrillo*=Port Limon:		
Gravenhorst & Co.....		300

AFRICAN.

		POUNDS.
OCTOBER 20.—By the *Amerika*=Hamburg:		
Arnold & Zeiss.....	7,500	
Ed. Maurer	3,500	
Rubber & Guayule Agency, Inc..	30,000	
Various	13,000	54,000
OCTOBER 21.—By the *Chicago*=Havre:		
Arnold & Zeiss.....		150,000
OCTOBER 23.—By the *Patricia*=Hamburg:		
Ed. Maurer	13,500	
Rubber & Guayule Agency, Inc..	5,000	18,500
OCTOBER 25.—By the *Baltic*=Liverpool:		
Henderson & Korn.....		7,000
OCTOBER 25.—By the *Kaiserin Auguste Victoria* =Hamburg:		
Rubber & Guayule Agency, Inc..	18,000	
Various	33,500	51,500
OCTOBER 28.—By the *Zeeland*=Antwerp:		
James T. Johnstone	15,000	
Rubber & Guayule Agency, Inc..	14,500	
Various	13,000	42,500
OCTOBER 30.—By the *Majestic*=Southampton:		
Various		12,000
NOVEMBER 3.—By the *Lapland*=Antwerp:		
Various		20,500
NOVEMBER 3.—By the *Cymric*=Liverpool:		
Meyer & Brown		2,200
NOVEMBER 5.—By the *Noordam*=Amsterdam:		
Various		1,500
NOVEMBER 5.—By the *Armenia*=Hamburg:		
Ed. Maurer	3,000	
Eggers Bros. & Pounds.....	2,000	
Rubber & Guayule Agency, Inc..	7,500	12,500
NOVEMBER 10.—By *La Savoie*=Havre:		
Meyer & Brown.....		2,500
NOVEMBER 10.—By the *Celtic*=Liverpool:		
Meyer & Brown.....	6,000	
Various	1,000	7,000
NOVEMBER 11.—By the *Caronia*=Liverpool:		
Robinson & Co.....	15,000	
Various	4,500	19,500
NOVEMBER 11.—By the *Pretoria*=Hamburg:		
Arnold & Zeiss.....	12,500	
Ed. Maurer	19,500	
Rubber & Guayule Agency, Inc..	50,000	
Ed. Maurer	22,500	
Various	18,500	123,000
NOVEMBER 13.—By the *Vaderland*=Antwerp:		
Various		30,000
NOVEMBER 14.—By the *President Grant*=Hamburg:		
Rubber & Guayule Agency, Inc.....		7,500
NOVEMBER 15.—By the *Cedric*=Liverpool:		
General Rubber Co.....	17,000	
Various	7,000	24,000
NOVEMBER 17.—By the *Amerika*=Hamburg:		
Ed. Maurer		30,000
NOVEMBER 18.—By the *Kroonland*=Antwerp:		
Meyer & Brown.....	67,000	
Various	19,000	86,000

EAST INDIAN.

[*Denotes plantation rubber.]

		Pounds.
OCTOBER 20.—By the *City of Durham*=Colombo:		
Meyer & Brown	*42,500	
Ed. Maurer	*4,500	
W. R. Grace & Co.	*4,000	*51,000
OCTOBER 20.—By the *Minnetonka*=London:		
General Rubber Co.	*190,000	
Malaysian Rubber Co.	*78,500	
Chas. T. Wilson	*50,000	
Meyer & Brown	*13,500	
Henderson & Korn	*13,500	
Ed. Maurer	*11,200	
Rubber & Guayule Agency, Inc.	*3,500	
James T. Johnstone	*1,500	*361,700
OCTOBER 20.—By the *St. Louis*=Southampton:		
W. R. Grace & Co.	*80,000	
Henderson & Korn	*45,000	
Arnold & Zeiss	*13,500	
Rubber Trading Co.	*2,200	
Malaysian Rubber Co.	*3,500	
Robinson & Co.	*6,000	
Various	*3,000	*153,200
OCTOBER 20.—By the *Amerika*=Hamburg:		
Ed. Maurer		*8,500
OCTOBER 21.—By the *Chicago*=Havre:		
Michelin Tire Co.		*35,000
OCTOBER 21.—By the *Potsdam*=Amsterdam:		
Rubber Trading Co.	*4,000	
Meyer & Brown	*1,200	*5,200
OCTOBER 22.—By the *Olympic*=Southampton:		
Arnold & Zeiss	*280,000	
Robinson & Co.	*50,000	
Ed. Maurer	*11,200	
W. Stiles	*9,000	
Chas. T. Wilson	*8,500	
Rubber Trading Co.	*6,000	*364,700
OCTOBER 23.—By the *Patricia*=Hamburg:		
Rubber & Guayule Agency, Inc.		*7,000
OCTOBER 24.—By the *Pathan*=Singapore:		
Henderson & Korn	*156,000	
Ed. Maurer	*70,000	
Ed. Boustead	*25,000	
Malaysian Rubber Co.	*22,500	
L. Littlejohn & Co.	*56,000	
James T. Johnstone	*36,000	
Ed. Maurer	*7,000	
Various	*8,000	*380,500
OCTOBER 25.—By the *Kaiserin Auguste Victoria*=Hamburg:		
Chas. T. Wilson		*2,500
OCTOBER 25.—By the *Indraghiri*=Singapore:		
Henderson & Korn	*130,000	
Ed. Maurer	*40,000	
W. R. Grace & Co.	*22,500	
Malaysian Rubber Co.	*12,500	
Johnstone & Co.	*4,000	
Various	*6,000	*215,000
OCTOBER 27.—By the *New Amsterdam*=Amsterdam:		
Meyer & Brown		*5,500
OCTOBER 27.—By the *Philadelphia*=Southampton:		
Chas. T. Wilson	*90,000	
Arnold & Zeiss	*25,000	
Meyer & Brown	*24,500	
Henderson & Korn	*22,500	
Ed. Maurer	*11,200	
W. R. Grace & Co.	*6,000	
Rubber & Guayule Agency, Inc.	*5,000	
Rubber Trading Co.	*4,000	*188,200
OCTOBER 28.—By the *Zeeland*=Antwerp:		
Meyer & Brown		*135,000
OCTOBER 28.—By the *Minneapolis*=London:		
General Rubber Co.	*275,000	
James T. Johnstone	*78,000	
Henderson & Korn	*17,000	
Malaysian Rubber Co.	*11,200	
Adolph Hirsch & Co.	*5,000	*386,200
OCTOBER 30.—By the *Majestic*=Southampton:		
Meyer & Brown	*13,000	
W. Stiles	*5,600	
Chas. T. Wilson	*8,500	
Robinson & Co.	*11,200	
Henderson & Korn	*3,000	
Ed. Maurer	*22,500	
Raw Products Co.	*3,000	
Arnold & Zeiss	*1,600	
James T. Johnstone	*11,000	*69,500
NOVEMBER 1.—By the *Casama*=Colombo:		
Meyer & Brown	*70,000	
Ed. Maurer	*56,000	
W. R. Grace & Co.	*63,500	
Various	*16,000	*205,500
NOVEMBER 3.—By the *Lapland*=Antwerp:		
Meyer & Brown	*246,000	
Arnold & Zeiss	*17,000	
Malaysian Rubber Co.	*11,200	
Various	*8,000	*282,200
NOVEMBER 3.—By the *Cymric*=Liverpool:		
General Rubber Co.		*45,000
NOVEMBER 3.—By the *New York*=Southampton:		
Meyer & Brown	*10,000	
Chas. T. Wilson	*16,000	
Arnold & Zeiss	*67,000	
Raw Products Co.	*3,500	
Ed. Maurer	*8,500	*105,000
NOVEMBER 5.—By the *Noordam*=Amsterdam:		
Various		*25,000
NOVEMBER 5.—By the *Minnehaha*= London:		
General Rubber Co.	*280,000	
Johnstone Whitworth Co.	*45,000	
Ed. Maurer	*11,200	
Various	*3,000	*339,200
NOVEMBER 5.—By the *Armenia*=Hamburg:		
Ed. Maurer		*4,000
NOVEMBER 6.—By the *Oosterdyk*=Amsterdam:		
Rubber Trading Co.	*45,000	
Meyer & Brown	*24,000	
Robert Badenhop	*13,500	*82,500
NOVEMBER 6.—By the *Oceanic*=Southampton:		
Henderson & Korn	*101,000	
Robinson & Co.	*12,500	
Ed. Maurer	*11,200	
James T. Johnstone	*9,000	
A. W. Brunn	*2,200	
Various	*11,200	*147,100
NOVEMBER 8.—By the *Kansas*=Singapore:		
Henderson & Korn	*110,000	
L. Littlejohn & Co.	*45,000	
Ed. Maurer	*40,000	
Malaysian Rubber Co.	*25,000	
E. Boustead	*14,500	
W. R. Grace & Co.	*10,000	
Arnold & Zeiss	*3,000	
James T. Johnstone	*15,000	
Various	*11,200	*273,700
NOVEMBER 10.—By the *Kandelfels*=Colombo:		
Meyer & Brown	*33,500	
H. W. Peabody & Co.	*11,200	
W. R. Grace & Co.	*11,200	
Ed. Maurer	*5,600	
Various	*10,000	*71,500
NOVEMBER 10.—By the *Celtic*=Liverpool:		
General Rubber Co.		*4,500
NOVEMBER 11.—By the *Pretoria*=Hamburg:		
Ed. Maurer	*2,500	
Arnold & Zeiss	*1,100	
Various	*7,500	*11,100
NOVEMBER 12.—By the *Minnewaska*=London:		
General Rubber Co.	*180,000	
Arnold & Zeiss	*157,000	
Chas. T. Wilson	*140,000	
James T. Johnstone	*56,000	
Meyer & Brown	*8,500	
Robinson & Co.	*6,700	
Various	*40,000	*588,200
NOVEMBER 12.—By the *Olympic*=Southampton:		
Ed. Maurer	*28,000	
W. Stiles	*13,500	
Robinson & Co.	*11,200	
Meyer & Brown	*11,000	
Various	*8,000	*71,700
NOVEMBER 13.—By the *Vaderland*=Antwerp:		
Meyer & Brown	*113,500	
Arnold & Zeiss	*17,000	
Malaysian Rubber Co.	*5,600	
Various	*2,200	*138,300
NOVEMBER 13.—By the *Ryndam*=Amsterdam:		
Meyer & Brown		*3,500
NOVEMBER 14.—By the *President Grant*=Hamburg:		
Rubber & Guayule Agency, Inc.	*9,200	
Chas. T. Wilson	*13,500	
Various	*2,000	*24,700
NOVEMBER 17.—By the *St. Louis*=Southampton:		
Meyer & Brown	*15,000	
Henderson & Korn	*27,500	
Arnold & Zeiss	*52,000	
Chas. T. Wilson	*36,000	
Robinson & Co.	*14,500	
Rubber Trading Co.	*7,000	
Raw Products Co.	*3,500	
W. R. Grace & Co.	*45,000	*200,500
NOVEMBER 17.—By the *Rotterdam*=Amsterdam:		
Rubber Trading Co.		*2,200
NOVEMBER 18.—By the *Kroonland*=Antwerp:		
Meyer & Brown	*245,000	
Malaysian Rubber Co.	*11,200	*256,200
NOVEMBER 18.—By the *Minnetonka*=London:		
Meyer & Brown	*31,600	
Ed. Maurer	*30,000	
James T. Johnstone	*25,000	
W. R. Grace & Co.	*35,000	
General Rubber Co.	*282,000	*403,600

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—OCTOBER, 1913.

Imports:	Pounds.	Value.
India-rubber	8,445,183	$4,568,813
Balata	90,433	44,537
Guayule	130,635	52,254
Gutta-percha	270,250	18,713
Gutta-jelutong (Pontianak)	1,870,740	81,502
Total	10,807,241	$4,765,819
Exports:		
India-rubber	36,300	$20,102
Balata	.....	.....
Guayule	.....	.....
Gutta-percha	.....	.....
Reclaimed rubber	63,659	11,539
Gutta-jelutong (Pontianak)	.....	.....
Rubber scrap, imported	1,098,149	$85,175
Rubber scrap, exported	295,955	41,615

BOSTON ARRIVALS.

IMPORTS IN OCTOBER, 1913.

	Pounds.	Value.
Guayule gum	35,789	$10,557
Gutta-jelutong	150,180	6,395
Gutta-percha	52,469	7,953
India rubber	13,550	8,821

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Antwerp.

RUBBER STATISTICS FOR OCTOBER.

DETAILS.	1913.	1912.	1911.	1910.	1909.
Stocks, September. *kilos*	455,120	708,127	435,545	580,908	397,454
Arrivals in October—					
Congo sorts	355,189	209,002	355,970	175,101	199,664
Other sorts	559	9,596	26,841	52,709	19,505
Plantation sorts	236,373	105,545	32,452	47,943	46,016
Aggregating	1,047,241	1,032,270	850,308	856,661	662,639
Sales in October	409,165	463,451	272,600	257,887	197,808
Stocks, October 31	638,076	568,819	578,208	598,774	464,831
Arrivals since January—					
Congo sorts	2,461,005	2,658,416	2,706,051	2,525,799	2,858,957
Other sorts	111,416	126,934	369,860	314,823	738,441
Plantation sorts	1,742,617	1,097,623	525,979	464,526	238,940
Aggregating	4,315,038	3,882,973	3,601,890	3,305,148	3,836,338
Sales since January 1	4,188,022	3,978,692	3,611,994	3,247,884	3,967,242

RUBBER ARRIVALS FROM THE CONGO.

OCTOBER 29.—By the steamer *Anversville:*

Bunge & Co	(Comfina) *kilos*	4,500	
do	(Belgika)	6,900	
do	(Comp. Commercial Congolais)	15,700	
do	(Générale Africaine)	750	
do	(Grands Lacs)	6,400	
do	(Intertropical)	23,300	
Société Coloniale Anversoise	(Comminière)	5,300	
Crédit Colonial & Commercial (Anc. L. & W. Van de Velde—S. A.)	(Cie du Kasai	161,400	
do	(Crevelde)	5,700	
Charles Dethier	(American Congo Co.)	9,950	239,900

Plantation Rubber From the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

[From January 1, to October 30, 1913. Compiled by the Ceylon Chamber of Commerce.]

	1912.	1913.
To Great Britain *pounds*	5,595,634	10,808,997
To United States	3,145,895	4,883,733
To Belgium	838,322	2,991,293
To Australia	212,396	401,913
To Japan	41,263	204,541
To Germany	140,424	203,516
To Straits Settlements	.....	86,980
To Italy	5,909	38,828
To Austria	55,351	30,097
To France	2,017	4,482
To Holland	2,282	992
To India	400	881
To Canada	16,065	.....
To Russia	2,288	.....
To Norway and Sweden	39	.....
	10,058,285	19,656,253

(Same period 1911—4,487,261 pounds; same 1910—2,223,341.)

The export figures of rubber for 1913 given in the above table include the imports re-exported, viz., 1,750,219 lbs. To arrive at the approximate quantity of Ceylon rubber exported for 1913 to date, deduct this quantity from the total exports. In previous years the exports of Ceylon rubber only were given.

TOTAL EXPORTS FROM MALAYA.

(From January 1 to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To	Singapore. Oct. 3.	Penang. Aug. 31.	Port Swettenham. Sept. 30.	Total.
Great Britain *pounds*	14,249,990	9,492,667	17,838,787	41,581,444
Continent	196,635	77,333	2,260,808	2,534,776
Japan	738,267	.....	.....	738,267
Ceylon	31,581	167,467	1,019,201	1,218,249
United States	4,464,606	202,000	.....	4,606,606
Australia	70,556	.....	.....	70,556
Total, 1913	19,751,635	9,939,467	21,118,796	50,809,898
Total, 1912	9,998,689	5,851,230	14,917,100	30,767,019
Total, 1911	4,538,628	3,042,612	8,525,001	16,106,241
Total, 1910	2,659,962	1,437,830	5,946,053	10,043,845